BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Pennsylvania Public Utility Commission	:	
	:	Docket No. R-2022-3031211
v.	:	
	:	
Columbia Gas of Pennsylvania, Inc.	:	

PSU Statement No. 1

DIRECT TESTIMONY OF JAMES L. CRIST, P.E.
ON BEHALF OF
THE PENNSYLVANIA STATE UNIVERSITY

[PUBLIC VERSION]

Dated: June 7, 2022

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS, AND ON WHOSE BEHALF YOU ARE TESTIFYING.

A. I am James L. Crist, President of Lumen Group, Inc., a consulting firm focused on regulatory and market issues. My business address is 4226 Yarmouth Drive, Suite 101, Allison Park, Pennsylvania 15101. I am presenting testimony on behalf of The Pennsylvania State University ("Penn State" or "PSU").

Q. DO YOU HAVE ANY QUALIFICATIONS OR OTHER SPECIALIZED KNOWLEDGE THAT WOULD ASSIST THE PENNSYLVANIA PUBLIC UTILITY COMMISSION ("COMMISSION") IN ITS DELIBERATIONS IN THIS CASE?

A. Yes. I have a B.S. in Chemical Engineering from Carnegie Mellon University and an M.B.A. from the University of Pittsburgh. Additionally, I am a Registered Professional Engineer in the Commonwealth of Pennsylvania. I have attached a copy of my CV and Regulatory Experience as Exhibits JC1.1 and JC1.2 respectively.

Q. BRIEFLY DESCRIBE YOUR RELEVANT BUSINESS QUALIFICATIONS.

A. I have run a consulting practice for the past 25 years focused on regulated and deregulated energy company strategy, market strategy, and regulatory issues. During 2004 and 2005, I undertook a consulting assignment as the Vice President of Consumer Markets for ACN Energy. ACN is a gas and electric marketer that is active in eight states. Prior to my consulting practice, I worked at three major energy companies for a total of 19 years. Most recently I was Vice President of Marketing for Equitable Resources. In that function I was responsible for the development of the company's deregulated business strategy.

Prior to that I was Vice President of Marketing for Citizens Utilities, responsible for gas, electric, water and wastewater marketing activities in several service territories within the United States. The gas and electric utility operations were in Vermont, Louisiana, Arizona, Colorado, and Hawaii. Under my direction, Citizens initiated commercial and industrial transportation and supply services at its gas operation in Arizona. I also directed significant gas supply contracting activities with large industrial and commercial customers in Citizens' gas operation in Louisiana.

Before that, during 1988 through 1994, I was the Marketing Director at the Peoples Natural Gas Company where I was actively involved in many gas transportation programs as the company relaxed transportation requirements so that customers would have supply choices.

In summary, I have considerable experience in several states involving residential, commercial, and industrial customer energy procurement, regulatory issues and industry restructuring programs.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE PENNSYLVANIA PUBLIC UTILITY COMMISSION?

A. Yes, I have appeared before the Commission in numerous gas and electric regulatory proceedings. I have been involved in the previous base rate cases of Columbia Gas of Pennsylvania, Inc. ("Columbia," "CPA," or the "Company") filed in 2008, 2009, 2010, 2012, 2014, 2015, 2016, 2018, 2020, 2021 and in its 2017 and 2019 purchased gas cost cases. Additionally, I provided testimony on a variety of issues relating to energy procurement,

industry restructuring, and demand response before regulatory Commissions in Arizona, Maryland, New Mexico, Illinois, Kentucky, Ohio, Wyoming and the U.S. Virgin Islands.

I. ISSUES

Q. WHAT ARE THE ISSUES YOU WILL DISCUSS IN THIS TESTIMONY?

A. Specifically, in my direct testimony I will address Columbia's base rate requests and then address Columbia's Cost of Service Study ("COSS") and recommendations. As in the past the Company conducted two COSS and produced an average COSS. The process it used is not reflective of cost causation and the recommendations made should not be accepted.

II. PENN STATE SERVICE

Q. WOULD YOU BRIEFLY DESCRIBE PENN STATE'S SERVICE FROM COLUMBIA?

A. Yes. Penn State is a major sales and distribution service customer of Columbia at Penn State's University Park campus and at its Beaver, Fayette, Mont Alto, and York campuses as well as the Biglerville Ag Extension Farm within the Commonwealth. In 2021, Penn State received approximately **[BEGIN CONFIDENTIAL]** [redacted] **END CONFIDENTIAL]**

Q. WHAT PIPELINES DELIVER GAS TO THE COLUMBIA DISTRIBUTION SYSTEM THAT SERVES THE UNIVERSITY PARK CAMPUS OF PENN STATE?

A. **[BEGIN CONFIDENTIAL]** [redacted] **[END CONFIDENTIAL]** Columbia removed access to a third pipeline supplier by closing the Snowshoe Lateral on June 30, 2018. Prior to closing the Snowshoe Lateral which connects to the Columbia Gas Transmission ("TCO") interstate pipeline, the lateral was the main delivery route to State College for Columbia's residential, commercial, and industrial customers. TCO was affiliated with Columbia until 2016 when the parent corporation, NiSource, sold TCO to TC Energy. Columbia then abandoned the Snowshoe Lateral route to TCO, its former affiliate. PSU contracts for the majority of its gas supply deliveries to the University Park campus through **[BEGIN CONFIDENTIAL]** [redacted] **[END CONFIDENTIAL]** and has done so since 2014.

III. COLUMBIA'S REQUEST OF $82.2 MILLION

Q. WHEN DID COLUMBIA LAST INCREASE ITS BASE RATES?

A. The Final Order in Columbia's most recent base rate case (Docket R-2021-3024296) was entered on December 16, 2021. The Company was awarded an increase of $58.5 million. It had requested $98.3 million. Columbia has increased its base rates frequently during

the past fifteen years as shown in this table which indicates the amount it filed for and the result of the settlements in each case.

Table 1: Columbia Rate filings

Docket No.	Test Year Ending	Proposed Increase ($Millions)	Ordered ($Millions)	%
R-2008-2011621	Sep-08	$58.9	$41.7	70.8%
R-2009-2149262	Sep-10	$32.3	$12.0	37.2%
R-2010-2215623	Sep-11	$37.8	$17.0	45.0%
R-2012-2321748	Jun-14	$77.3	$55.2	71.4%
R-2014-2406274	Dec-15	$54.1	$32.5	60.1%
R-2015-2469665	Dec-16	$46.0	$27.1	58.9%
R-2016-2529660	Dec-17	$55.3	$35.0	63.3%
R-2018-2647577	Dec-19	$46.9	$26.0	55.4%
R-2020-3018835	Nov-20	$100.4	$63.5	63.1%
R-2021-3024296	Dec-22	$98.3	$58.5	59.5%

Prior to the filing in 2008, Columbia had not filed a base rate case since 1995. Now the Company seeks an increase of $82.2 million.

Q. WHAT OTHER MECHANISM WAS PUT INTO PLACE IN 2013 TO SUPPORT INFRASTRUCTURE DEVELOPMENT OF NATURAL GAS DISTRIBUTION COMPANIES?

A. On March 14, 2013, the Commission approved Columbia's Distribution System Improvement Charge ("DSIC") which allows Columbia to recover reasonable and prudent costs incurred to repair, improve, or replace certain eligible distribution property that is part of the utility's distribution system. Columbia was the initiator of the DSIC filing at Docket No. P-2012-2338282. It claimed that if a DSIC were in place there would be a reduced need to file base rate cases.

Q. WHAT IS THE CAP OF COLUMBIA'S DSIC RIDER?

A. The DSIC is capped at 5.0% of distribution service revenues.

Q. USING COLUMBIA'S DSIC CAP OF 5.0% OF TOTAL NON-GAS REVENUES, WHAT COULD THE DSIC AMOUNT BE?

A. In Columbia's Exhibit 103, P. 10, the proposed distribution (non-gas) revenues are stated at $533,536,411. In this case the DSIC amount would be $26.6 million. The revenue increase proposed in this case is $82.2 million. While I cannot predict the outcome of this proceeding and do not know what the final revenue increase will be, it would be highly unlikely that it will be the entire request, and much more likely that it will be some fraction of that. Having a DSIC provides Columbia the ability to receive revenue of a similar magnitude as what it may receive in this case.

Q. WHAT OPERATING EXPENSES SHOULD BE REDUCED IF THE COMPANY IMPROVED ITS DISTRIBUTION SYSTEM?

A. One could reasonably expect that significant capital investment in Columbia's infrastructure would produce numerous improvements such as reduced gas losses due to leaks, better gas control, reduced labor and maintenance costs and other benefits that should be reflected through *pro forma* adjustments to its expense claims. Unfortunately, the overall operation and maintenance expenses filed in this case have increased significantly from the most recent 2021 case and those *pro forma* reductions do not appear.

Q. SHOULD COLUMBIA BE ABLE TO ATTRACT LOWER CAPITAL COSTS AS A RESULT OF THE AVAILABILITY OF ITS DSIC?

A. Yes. A utility whose rate structure includes a DSIC is able to recover the cost of capital investment continuously instead of waiting for a base rate filing that would include the cost of new investment in the utilities rate base. The ability to recover capital costs is beneficial to the utility and should lead to lower costs. Columbia's Ms. Krajovic testified in its DSIC filing at Docket P-2012-2338282 that "While infrastructure replacement will result in rate increases for Columbia's customers, the availability of the DSIC will enable the Company to attract lower cost capital." (Statement No. 1, 3:6-8). In the current proceeding, Mr. Moul, the Company's outside consultant for rate of return issues, testified that "The cost of capital for CPA, however, is not affected by the DSIC" (Statement No. 8, 9:14) and claims that because other natural gas companies are undertaking infrastructure rehabilitation mechanisms, the lower cost of capital promised by Ms. Krajovic is already accounted for. Natural gas utilities have been conducting infrastructure replacement of steel pipe for decades and Mr. Moul's contention that the benefit of the DSIC should be ignored is not credible. His efforts to increase the Company's rate of return from the forecasted 6.13% overall rate of return stated in its filing (Statement No. 1, 25:12-16) should be rejected.

IV. <u>COST OF SERVICE STUDY</u>

Q. WHAT IS A COST OF SERVICE STUDY?

A. A Cost of Service Study ("COSS") examines costs incurred by the utility and allocates those costs into distinct customer classes. To produce an accurate COSS it is necessary to possess quality accounting data detailing utility expenses and be able to determine assignment of expenses to customer classes. Expenses must be examined in detail to determine what customer or class of customers created the need for the utility to make the expenditure. This identification of expense responsibility is known as cost causation. In Columbia's 2020 case the Final Order defined the COSS as "a benchmark for evaluating customer class cost responsibility with the fundamental purpose of aiding in the accurate and reasonable design of rates by identifying all the capital and operating costs incurred by the utility in serving its customers, and then directly assigning or allocating these costs to each individual rate class ***based on established principles of cost-causation***." (emphasis added). It is critical that the Commission recognized that the COSS must be based on cost causation.

Q. WHAT IS COST CAUSATION?

A. This fundamental principle of ratemaking assigns costs to those classes of customers that are responsible for the incurrences of costs. The Commission has been consistent in its policy that considers cost causation as a fundamental principle and the bedrock of cost assignment in the ratemaking process. Failure to adhere to proper cost causation will create mis-allocations of cost which result in cross-class subsidization. This principle may not be violated just because some customers do not like bearing the costs or want to lessen the impact of the cost of the benefits they receive at the expense of others, nor may it be violated because a utility wishes to benefit one customer class at the expense of another.

In the landmark case *Lloyd v. Pennsylvania Public Utility Commission*, 904 A.2d 1010 (Pa. Cmwlth. 2004) the Commonwealth Court declared cost of service as the "polestar" of ratemaking, and directed the Commission to set non-discriminatory reasonable rates.

Q. WHAT ARE THE COST CLASSIFICATION CATEGORIES USED IN A COST OF SERVICE STUDY?

A. Costs are classified as demand related, energy or commodity related, or customer related. It is critical in cost of service studies to accurately determine cost causation by identifying the primary causative factor. In some cases there is only one causative factor.

Q. WHAT EXPENSES ARE DEMAND DRIVEN?

A. Demand costs vary and are dependent on the peak or maximum throughput. Engineering planning will examine the peak design day and base engineering designs on meeting throughput demands on that day. Components of the distribution system that are demand driven are gas mains, and the related operation and maintenance expense. This is the major component of rate base. Company witness Mr. Johnson stated, "Mains and services account for the majority of the Company's gross plant investment and distribution O&M expenses, excluding gas costs." (Statement No. 6, 10:10-11)

Q. WHAT EXPENSES ARE ENERGY DRIVEN?

A. The largest energy cost (also known as commodity or average demand cost) is the cost of purchased gas. The cost of purchased gas is not under consideration in this rate case as this is a base rate proceeding and we are considering the non-gas revenues of the Company. Other non-gas costs that are energy driven would be variable operation and maintenance expenses that can be identified as related to throughput. An example of this would be the O&M cost of a natural gas compressor. Such a piece of equipment would experience

higher operating hours with greater throughput and incur correspondingly higher O&M expenses, similar to an automobile. If the car has been parked in the garage mostly since an owner has been working from home the maintenance needs (oil changes, filter, belts, brake pads, tires) have been less than when the car was driven for a daily commute to the office.

Q. WHAT EXPENSES ARE CUSTOMER DRIVEN?

A. Expenses that vary directly with the number of customers would be meters and services, customer contact centers, billing systems and a portion of distribution mains. Each customer has a gas meter. Of course, the small residential meter may cost less than a larger industrial meter but the meter costs are clearly customer driven. Customer contact centers need to be sized appropriately to manage the volume of daily calls, and they must grow as the number of customers increases. The size of the customer in terms of demand or volume does not make an impact on the number of calls to the call center. The billing system produces bills for Columbia's 440,408 customers. (source: Exhibit No. 3, page 1). Again, size in terms of demand or volume does not matter as all customer bills are calculated, printed or imaged, and mailed or emailed.

Q. IS THERE A CUSTOMER COMPONENT OF MAINS AND DISTRIBUTION SYSTEMS?

A. Yes. Mr. Johnson included a customer component in his allocation of gas mains cost for his COSS. Gas piping systems through neighborhoods obviously must be designed to reach from customer to customer so are partially customer-based, along with being demand based. Mr. Johnson explained, "The allocation of a portion of distribution mains costs on

a customer basis is appropriate because of the way the distribution system is designed." (*Id*. 15:5-6)

Q. WHAT COST OF SERVICE STUDIES DID THE COMPANY UNDERTAKE?

A. Company witness Mr. Johnson (Statement No. 6) explained that as in past base rate cases the Company conducted two COSS and then produced an average of the two, so three studies in all. The two studies, known as the customer-demand study and the peak & average study, allocate the cost of mains differently. Mr. Johnson also produced the average study. In prior rate cases, including the recent 2020 Columbia base rate case, Columbia's rate design witnesses used the average study as the primary guide for allocation of the revenue increase, but Mr. Johnson did not use the average study in this rate case as the primary guide for allocation. Instead, Mr. Johnson used the peak & average COSS.

Q. WHY DID THE COMPANY USE THE PEAK & AVERAGE COSS IN THIS RATE PROCEEDING?

A. The only reason Mr. Johnson stated was, "Columbia recognizes this Commission's preference for the use of the peak and average study, and therefore used the peak and average study as the primary guide for the allocation of the revenue increase in this case." *Id* 4:10-12 Mr. Johnson abandoned the Company's long practice of using the average study, not because use of the peak & average study was a more accurate reflection of cost causation, but only because the Commission, in the litigated 2020 rate case, relied on the Peak & Average study due to alleged "errors"[1] in the other Customer-Demand study presented by Columbia. Because Columbia has fixed the errors identified in the ALJ's

[1] In the 2020 base rate proceeding, Company witness Mr. Notestone did not make computational mistakes in the Customer-Demand study but OCA's Mr. Mierzwa opined that a different methodology of treatment of mains investment was appropriate and that Mr. Notestone's method was an error.

Recommended Decision that the Commission adopted, the Company, at the very least, should average the two COSS methods. It is crucial to keep the ALJ's ruling in proper context and not use it as a basis to reject the Customer Demand COSS.

Q. WHAT WAS THE ALJ's RECOMMENDATION IN COLUMBIA'S 2020 BASE RATE CASE?

A. In her Recommended Decision[2] ALJ Dunderdale stated, "The ALJ recommends the Commission use the Peak & Average COSS, as promoted by OCA, in this base rate proceeding. ***Columbia Gas' Customer Demand COSS would be the preferred method***, but it contains serious flaws that skews its reliability and makes it unsuitable for use at this time and with this NGDC." RD at 394 (emphasis added).

Q. DID COLUMBIA MAKE THE SAME "ERRORS" IN THE CUSTOMER/DEMAND COSS IN THIS PROCEEDING?

A. No. The "errors" that were referred to stem from an argument advanced by OCA Witness Mr. Mierzwa that Mr. Notestone, Columbia's COSS witness in its 2020 base rate case, should not have separated gas main investment by operating pressure. The Commission stated:

> Mr. Mierzwa argued that the Company's separation of mains investment by operating pressure should be removed, primarily due to its use of original cost instead of net investment in the development of its allocation factors for each of the distribution mains categories. More specifically, Mr. Mierzwa challenged the Company's separation of mains by pressure group in the study because the allocation uses original cost and not net investment. Mr. Mierzwa asserted that the separation of pressure groups based on gross plant investment does not take into account the age of the pipe, and low-pressure pipe is generally older and, therefore, more depreciated than regulated pressure pipe. Mr. Mierzwa contended that because 53% of the low-pressure system is constructed of steel, and because steel pipe is generally older and, therefore, more depreciated than plastic pipe,

[2] Docket No. R-2020-3018835 (R.D. issued Dec. 4, 2020).

> customers served off low pressure pipe should be assigned less net investment than regulated pressure customers.

(Final Order at 194). In this proceeding Columbia's Mr. Johnson did not separate mains by pressure. He testifies:

> **Q. Have you again performed a detailed analysis of each of Columbia's low pressure and higher pressure systems in this case?**
>
> A. Similar to the Company's 2021 rate case, Columbia did not perform this analysis. Mains cost allocation factors produced from the separation of mains by pressure study are not materially different than the mains allocators produced from simply using total mains (i.e. no separation of mains by operating pressure). This is largely due to Columbia's pipe replacement efforts over the last several years which have had the effect of phasing out its low pressure mains. Columbia's low pressure mains are typically older and constructed of cast iron or steel pipe. Over time, Columbia has been replacing this low pressure pipe with plastic pipe operated under higher pressures. Therefore, the results produced from the separated mains pressure study have become less meaningful as the system has become more homogenous in terms of operating pressure.

(Columbia Gas Statement No. 6, 8:21-9:11).

Thus, Mr. Johnson removed the "error" that swayed the ALJ to choose the Peak & Average COSS over the Customer-Demand COSS, even though she stated that "Columbia Gas' Customer Demand COSS ***would be the preferred method***." (emphasis added)

Q. WHAT DID THE COMMISSION STATE IN ITS FINAL ORDER IN COLUMBIA'S 2020 BASE RATE CASE?

A. "(W)e are not persuaded to reverse the ALJ's Recommended Decision that adopted the OCA's P&A ACCOSS and methodology in this proceeding." Final Order at 211. Since the ALJ's Recommended Decision stated that the Customer-Demand COSS would be the preferred method were it not for errors, and therefore she recommended use of the Peak & Average COSS, which we can think of as the runner-up in this competition, having come out on top only because the best COSS contained some "errors." That is not the case in

this proceeding because those past "errors" are not present in the current Customer-Demand COSS.

Q. WHY SHOULD THE CUSTOMER DEMAND COSS BE THE PREFERRED METHOD FOR COST ALLOCATION AS STATED IN THE 2020 COLUMBIA RATE CASE RECOMMENDED DECISION?

A. It is important to make decisions based on facts and engineering. Since the key issue in selecting a COSS is the treatment of expenses on gas mains, and we know that gas mains and their maintenance costs are the largest component of the rate base and operating expenses, it is critical that the process to plan, design, and construct gas mains be the basis of the COSS. Therefore, I reviewed the responses to several data requests investigating the actual engineering process to determine the design of the distribution system and the sizing of the gas mains.

Q. HOW DOES THE COMPANY DETERMINE THE ENGINEERING REQUIREMENTS NECESSARY FOR THE INSTALLATION OF GAS MAINS?

A. I reviewed the responses to several data requests about this subject, which I have included as Exhibit PSU-1. The critical and significant data collected by the Company is the total BTU/hr connected load. See Exhibit PSU-1, response to PSU 1-001, PSU 1-002, PSU 1-006, PSU 1-011. In its response to PSU 1-001 Columbia stated:

> In general, sizing mainlines within our distribution systems is based upon many factors. They include: the MAOP (maximum allowable operating pressure), the normal operating pressure, the minimum operating pressure (under peak conditions), the delivery pressure requested on behalf the

> customer, the length of main, and of course load information (typically in terms of Mcfh - 1000 cubic foot per hour).

PSU I-002 examined the process of planning a new construction project for a residential customer. The Company listed the following data it collects regarding the layout and location of the property and gas line:

- Where is the house line stubbed or marked? Left/right/other-specify
- What delivery pressure is needed at the meter outlet?
  - 7" W.C. (standard delivery pressure)
  - 2 PSI
- What is the approximate distance in feet from the property line to the meter location?
- Is the construction site within 6" of final grade with foundation backfilled?
- ***What is the total BTU load?*** (emphasis added)
- Are there any obstructions that would hinder the service line installation?
- Are private utilities marked?

Of critical importance is that the only factor that described gas usage was the request for "total BTU load" and nothing regarding annual consumption. Similar data requests examined the planning process for commercial and industrial customers, and likewise the planning and engineering process relied solely on total BTU load, and not on annual consumption.

When asked about meter and service line sizing in response to PSU 1-006 Columbia stated:

> The connected load of a customer moving into an existing facility would be based upon the total rating (either in BTUs - British Thermal Units, or cubic

> feet of gas per hour) of the gas appliances to be used by the customer. This information is provided to Columbia of PA, Inc., by the customer.
>
> Once the load information has been determined, the service line would be sized based upon the factors identified in the response to PSU 1-001.

To be clear, the term "connected load" does not refer to annual throughput or annual load but instead the demand of the customer. This is clearly stated in the response to PSU I-011:

> Question No. PSU 1-011:
>
> Explain how Columbia determines total BTU load during engineering work associated with customer connections and pipeline sizing? What does a customer have to do to obtain such information?
>
> Response:
>
> For engineering work associated with a proposed new customer connection and pipeline sizing, the total BTU load is provided to Columbia of PA, Inc. by the customer. It is typically in the form of BTUs (British Thermal Units) or cubic feet of gas per hour.
>
> For engineering work associated with existing loads and pipeline sizing, Field Engineers use Synergi Gas, Columbia's modeling software program (which models our pipeline systems), to assist in sizing mainlines, to help ensure safe and reliable service to all our customers.
>
> This load information (in Synergi Gas) is in terms of Mcfh (thousand cubic feet of gas per hour) and is based on current usage of our existing customers and any new information provided Columbia (such as proposed new loads mentioned above). Our particular model is distinct to Columbia's pipeline system and is proprietary. This information is not provided to customers.

None of the data used for pipe sizing and distribution system planning, engineering, and construction include annual commodity usage. Repeatedly Columbia asserts it considers the demand load information, expressed in terms of BTU/hr. The Company collects this BTU/hr data through its web-based tool or through customer interviews. My review of the Company's data request responses, including the Company manuals and procedures have

identified that connected load, along with delivery pressure and length of pipe necessary to attach to the customer are the only data used in gas main design and sizing.

The process that Columbia uses is similar to the process that I am familiar with during my twenty-plus years working for natural gas distribution companies. As Director of Residential and Commercial Marketing for Peoples Gas, and Vice President of Marketing for Citizens Utilities, I regularly reviewed new gas main line project documents that contained engineering data to determine line sizes, and as a Registered Professional Engineer in the Commonwealth, I am familiar with the process that the facilities design engineer goes through in pipeline design.

Q. IS ANNUAL ENERGY CONSUMPTION CONSIDERED IN THE ENGINEERING DESIGN OF GAS MAINS?

A. No. The annual throughput, or annual load, or in COSS jargon the "average demand" is not used in the design and determination of gas main piping. Instead, the cost causer of gas mains is the demand, not the commodity use, of the customer. All sizing of pipe (the pipe diameter, and subsequent system operating pressure) is determined by the demand, which is based on connected load in BTU/hr.

Q. WHAT COST OF SERVICE STUDY IS BASED ON COST CAUSATION OF GAS MAINS INSTALLATION AND OPERATION?

A. The cost of service study that is based on cost causation is the Customer-Demand study conducted by Columbia. It properly determines the allocation of gas main piping costs based on how the piping system was designed using the connected demand. The Peak and Average method used in the other COSS conducted by the Company does not apply cost causation accurately because it allocates the costs of gas mains based in large part on the

average demand or annual throughput and that is a violation of cost causation principles. Such allocations result in cost-shifting and cross-class subsidization which must be avoided and is not good ratemaking. The Peak & Average COSS prepared by Mr. Johnson must be rejected and the allocation of revenue that Mr. Johnson presented based on that COSS must also be rejected. In its place should be the Customer-Demand COSS that was also prepared by Mr. Johnson, along with the allocation that is determined using the Customer-Demand COSS. Mr. Johnson should submit a revised Exhibit 103, Schedule 8 based on the Customer-Demand COSS in his rebuttal testimony.

The average COSS and the allocation of revenue based on the average COSS must also be rejected for it also violates cost causation principles because it incorporates the same issues that are inherent in the Peak & Average COSS. Thus, the Customer-Demand COSS should be the preferred approach by the Commission.

Q. WHAT IS THE SUMMARY OF YOUR TESTIMONY?

A. To ensure that the correct cost allocation of the revenue requirement is based on cost causation, the allocations based on the Customer-Demand COSS presented by the Company must be used. Mr. Johnson's recommendation of allocating revenue using a study that does not adhere to cost causation principles must be rejected. Should the Commission wish to gradually move to the allocation based fully on cost causation, in the alternative, at the very least the averaging of the two studies should be adopted.

Q: DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes.

Exhibit PSU-1

Columbia Gas of Pennsylvania, Inc.

COLUMBIA GAS OF PENNSYLVANIA, INC.
2022 RATE CASE PROCEEDING

Docket No. R-2022-3031211

Data Requests

The Pennsylvania State University INTERROGATORIES
Set 1

Question No. PSU 1-001:

Provide all documents or manuals used to determine sizing of distribution system piping in new construction. Explain any differences in procedures that depend on customer classification (residential, commercial, industrial)

Response:

In general, sizing mainlines within our distribution systems is based upon many factors. They include: the MAOP (maximum allowable operating pressure), the normal operating pressure, the minimum operating pressure (under peak conditions), the delivery pressure requested on behalf the customer, the length of main, and of course load information (typically in terms of Mcfh - 1000 cubic foot per hour).

Columbia Gas of PA, Inc., will determine the size mainline to be utilized based on flow guidelines provided per our Gas Standards. See HIGHLY CONFIDENTIAL Attachment A to this response. There are different criteria used dependent on the pressure range of our operating systems, to minimize pressure drop, so we can meet the new load demand, as well as the demands of our current customers. Columbia will also determine if the main should be comprised of medium density, high density, or steel, depending on the MAOP or capacity needed.

Also, Synergi, Columbia's software modeling software (which models our systems) is used to confirm recommendations of sizing mainlines, to help ensure safe and reliable service to all our customers.

These same processes and procedures apply to residential, commercial, and industrial accounts.

Columbia Gas of Pennsylvania, Inc.

COLUMBIA GAS OF PENNSYLVANIA, INC.
2022 RATE CASE PROCEEDING

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Data Requests

The Pennsylvania State University INTERROGATORIES
Set 1

Question No. PSU 1-002:

Provide all forms, or screenshots of data collection, that are used to initiate a new construction project for a residential customer.

Response:

For a new construction project for a residential customer, the data collection occurs over the phone in our New Business center or via an on line form submission at *columbiagaspa.com/partner-with-us/builders-and-developers*. Whether by phone or form submission, following is the data collected to initiate new service.

- Where is the house line stubbed or marked? Left/right/other-specify
- What delivery pressure is needed at the meter outlet?
  - 7" W.C. (standard delivery pressure)
  - 2 PSI
- What is the approximate distance in feet from the property line to the meter location?
- Is the construction site within 6" of final grade with foundation backfilled?
- What is the total BTU load?
- Are there any obstructions that would hinder the service line installation?
- Are private utilities marked?

Columbia Gas of Pennsylvania, Inc.

COLUMBIA GAS OF PENNSYLVANIA, INC.
2022 RATE CASE PROCEEDING

Docket No. R-2022-3031211

Data Requests

The Pennsylvania State University INTERROGATORIES
Set 1

Question No. PSU 1-006:

Explain the process of determining the connected load used when initiating service with a commercial customer moving into an existing facility. Explain once connected load is determined how that is considered in the determination of meter size, and service line size.

Response:

The connected load of a customer moving into an existing facility would be based upon the total rating (either in BTUs - British Thermal Units, or cubic feet of gas per hour) of the gas appliances to be used by the customer. This information is provided to Columbia of PA, Inc., by the customer.

Once the load information has been determined, the service line would be sized based upon the factors identified in the response to PSU 1-001.

In general, sizing the meter would utilize the same factors as listed above, with the exception of length. Per the manufacturer's specifications of what meters Columbia use, the meter would be sized accordingly based upon the pressure going through the meter to accurately measure the load requested by the customer.

Columbia Gas of Pennsylvania, Inc.

COLUMBIA GAS OF PENNSYLVANIA, INC.
2022 RATE CASE PROCEEDING

Docket No. R-2022-3031211

Data Requests

The Pennsylvania State University INTERROGATORIES
Set 1

Question No. PSU 1-011:

Explain how Columbia determines total BTU load during engineering work associated with customer connections and pipeline sizing? What does a customer have to do to obtain such information?

Response:

For engineering work associated with a proposed new customer connection and pipeline sizing, the total BTU load is provided to Columbia of PA, Inc. by the customer. It is typically in the form of BTUs (British Thermal Units) or cubic feet of gas per hour.

For engineering work associated with existing loads and pipeline sizing, Field Engineers use Synergi Gas, Columbia's modeling software program (which models our pipeline systems), to assist in sizing mainlines, to help ensure safe and reliable service to all our customers.

This load information (in Synergi Gas) is in terms of Mcfh (thousand cubic feet of gas per hour) and is based on current usage of our existing customers and any new information provided Columbia (such as proposed new loads mentioned above). Our particular model is distinct to Columbia's pipeline system and is proprietary. This information is not provided to customers.

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Pennsylvania Public Utility Commission	:	
	:	Docket No. R-2022-3031211
v.	:	
	:	
Columbia Gas of Pennsylvania, Inc.	:	

PSU Statement No. 1-R

REBUTTAL TESTIMONY OF JAMES L. CRIST, P.E.
ON BEHALF OF
THE PENNSYLVANIA STATE UNIVERSITY

Dated: July 6, 2022

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS, AND ON WHOSE BEHALF YOU ARE TESTIFYING.

A. I am James L. Crist, President of Lumen Group, Inc. I previously presented direct testimony and now I am presenting rebuttal testimony on behalf of The Pennsylvania State University ("Penn State" or "PSU" or the "University").

Q. WHAT ARE THE ISSUES YOU WILL ADDRESS IN THIS REBUTTAL TESTIMONY?

A. Specifically, in my rebuttal testimony I will review several allocated cost of service study ("ACOS" or "COSS"[1]) recommendations made by OCA witness Mr. Mierzwa, I&E witness Mr. Cline, and OSBA witnesses Mr. Ewen and Mr. Knecht. Because their views are not based on cost causation, they skew the revenue responsibility, which is unacceptable. I will provide evidence why the Peak & Average ACOS that they prefer, which is not based on cost causation, should not be used and that the Customer-Demand Cost of Service Study performed by the Company, which is based on cost causation, is valid and should be utilized to allocate any increase granted by the Commission.

Q. WHAT ACOS DID THE COMPANY USE TO DETERMINE THE REVENUE RESPONSIBILITY OF THE CUSTOMER CLASSES?

A. Company witness Mr. Johnson explained:

> "Columbia has filed two studies in its base rate proceedings since the early 1980s that provide the outside limits of the possible allocations of mains to the various classes of service. The customer-demand study (Exhibit No. 111, Schedule 1) produces results that

[1] Both Allocated Cost of Service ("ACOS") and Cost of Service Study ("COSS") refer to the same thing. Both terms have been used in the testimony of other witnesses, and myself, and in previous Commission recommendations and orders.

> are generally more favorable to the industrial class, while the peak and average study (Exhibit No. 111, Schedule 2) produces results that are generally more favorable to the residential class. Columbia has in the past submitted that the results of two such studies provided a reasonable range of returns for use as a guide in establishing appropriate rates. Columbia continues to believe that the two studies provide the reasonable range of returns for use in revenue allocation. However, Columbia recognizes this Commission's preference for the use of the peak and average study, and therefore used the peak and average study as the primary guide for the allocation of the revenue increase in this case." Statement No. 6, 4:1-12.

The Peak & Average ACOS is the methodology that favors the residential class heavily, and the Company used those study results to determine revenue allocations. This is a departure from the Company's practice in the nine previous rate cases from 2008 through 2020 where the Company used its Average ACOS as the basis for determining class rates of return and revenue allocation. In 2021, the Company departed from its historic practice because the Administrative Law Judge ("ALJ") indicated her concern with an issue in the Customer-Demand study in 2020 at Docket No. R-2020-3018835. I will explain the ALJ's decision in more detail, explain that her concern was addressed and since has been corrected, and what has changed with the Company's filing in this case. In sum, the changes the Company has made to the Customer-Demand ACOS in this case removes the issue that the ALJ identified in not selecting the Customer-Demand method which she stated was "preferred." R.D. at 394. Based on the ACOSs filed by the Company in this case, the Customer-Demand ACOS should be the basis for revenue allocation.

Q. WHAT ACOS DID OCA WITNESS MR. MIERZWA RECOMMEND?

A. Mr. Mierzwa recommended the use of the Company's Peak & Average ACOS. In his direct testimony, Mr. Mierzwa reviews the methodologies used in the three ACOSs

conducted by the Company. He explains that the investment in distribution mains is allocated differently in two of the ACOSs. In the Customer-Demand ACOS, the cost of mains is allocated to the individual rate classes based on the number of customers in the rate class (the "customer" part of "customer-demand"), and also based on the design peak day demands of the customers in each rate class (the "demand" part of "customer-demand").

He then describes the Peak & Average method where main investment is allocated 50 percent based on the design peak day demands and 50 percent based on the annual demand, which is the same as total annual throughput. He also explained that the Company produced an Average ACOS, which is an average of the Customer-Demand and Peak & Average studies.

Mr. Mierzwa continues his testimony explaining that the primary guide for the distribution of revenue was the Company's Peak & Average ACOS because of the Commission's decision at Docket No. R-2020-3018835. He states that he agrees with using the Peak & Average ACOS to determine revenue distribution.

Q. WHAT IS MR. MIERZWA'S OPINION OF THE COMPANY'S PROPOSED REVENUE DISTRIBUTION?

A. Mr. Mierzwa states that the revenue increase Columbia proposed for customer classes SGSS/DS-1, SGSS/DS-2, SDS/LGSS, and LDS/LGSS customers is not enough and that these customer classes should be allocated an even greater share of the overall revenue increase. Specifically, Mr. Mierzwa wants to increase the SGSS/DS-1 group from $48.2 million to $55.1 million, the SGSS/DS-2 group from $50.1 million to 57.3 million, the

SDS/LGSS group from $30.2 million to $36.2 million and the LDS/LGSS group from $23.9 million to $30.6 million, according to his Table 3. Examination of Table 3 shows that Mr. Mierzwa's intention is to increase the SDS/LGSS and LDS/LGSS classes by over 28%, while increasing the residential classes by only 10.5%.

Q. WHAT IS MR. MIERZWA'S REASON FOR WANTING TO SHIFT ADDITIONAL REVENUE RESPONSIBILITY TO THE LDS/LGSS CUSTOMERS?

A. According to Mr. Mierzwa, the Peak & Average method results showed a relative rate of return at present rates for the LDS/LGSS customers of 0.27.

Q. WHAT CAUSED THE LOW RELATIVE RATE OF RETURN?

A. The total revenue requirement and the class allocation of revenues in the previous eight rate cases from 2008 through 2018 were determined through a settlement process that resulted in "black box" settlements. In such settlements the parties in the case, including the Company, reach agreement on the total revenue increase and how that increase will be allocated to the customer rate classes. It is not specified what ACOS was used or what class rates of return were calculated. The resulting class revenue allocations are included as part of the settlement recommendations submitted to the ALJ and then incorporated into the ALJ's recommended decision and generally adopted and approved by the Commission. It is important to note that the parties that represent the interests of the different customer groups (residential, commercial, industrial, flex) all compromise and reach agreement through the give-and-take discussions of the settlement process. "It is the Commission's

policy to encourage settlements. In most cases, the parties work diligently to find common grounds upon which to settle the case in whole or part."[2]

In those eight previous rate cases the revenue allocations proposed by the Company in its filings were based on the results from the Average ACOS, then further determined by settlement discussions of all the parties. I have been involved in those discussions and found them to be productive and fair. Unlike those prior settlements, in the 2020 proceeding, the revenue requirement was fully litigated and, as I described in my direct testimony, the ALJ recommendation for the ACOS methodology was that the Peak & Average ACOS should be used due to some perceived flaws in the preferred method, the Customer-Demand ACOS.

It is to be expected that when comparing the class rates of return of the previous eight rate cases that were settled, with the result in this rate case of the Peak & Average ACOS, a method that greatly favors residential customers, that the LDS/LGSS would be shown to have a low relative rate of return. Mr. Mierzwa wants to "fix" that by moving additional revenue responsibility to the LDS/LGSS customers resulting in a 28% rate hike. This is unconscionable. His method is not appropriate because it is not based on cost causation and certainly not consistent with the revenue allocations that were determined by compromise throughout the pre-pandemic period of 2008 through 2019.

Q. IS THE CUSTOMER-DEMAND ACOS PROPOSED IN THIS CASE FREE OF ERRORS?

[2] Pennsylvania Public Utility Commission A Guide To Utility Ratemaking, James H. Cawley & Norman J. Kennard (2018) at 47.

A. Yes. In 2020, the ALJ stated that "Columbia Gas' Customer Demand COSS would be the preferred method" R.D. at 394. However, the ALJ felt that the Customer Demand COSS in that particular case contained flaws that skewed its reliability and made it unsuitable for use ***at that time*** (emphasis added) by Columbia. Importantly, that was not a permanent prohibition of using the preferred Customer-Demand ACOS and the evidence I presented in my direct testimony proves that the Customer-Demand ACOS is the only method based on cost causation, the foundation of a cost of service study. I explained in my direct testimony that when Company witness Mr. Johnson produced the current Customer-Demand ACOS, he did not separate gas mains by pressure, which removes the issue that swayed the ALJ to recommend that the 2020 Customer-Demand ACOS not be used. Supporting the accuracy of the current Customer-Demand ACOS, I note that none of the witnesses (Mr. Mierzwa, Mr. Cline, Mr. Knecht) cited any issues or concerns with Columbia's Customer-Demand study.

Q. IS THE COMPANY'S PROPOSED REVENUE DISTRIBUTION JUST AND REASONABLE?

A. No. For the same reasoning I explained, you cannot take customer class revenue allocations that have been established in eight rate cases since 2008 by compromise settlements and force an extreme result from the Peak & Average ACOS onto customers and expect an increase that is not draconian. The Company's proposed increase for the LDS/LGSS customers was 21.9% compared to the increase proposed for residential customers of 13.4%. It is grossly unjust and unfair. If adopted as proposed by Columbia, this could result in dire consequences to the businesses and institutions in the LDS/LGSS

class who have faced the challenges of Covid impacts to business operations and are still dealing with such disadvantageous business conditions and rampant inflation.

Q. WHAT ACOS DID THE BUREAU OF INVESTIGATION AND ENFORCEMENT WITNESS MR. CLINE RECOMMEND?

A. Similar to Mr. Mierzwa in his direct testimony (I&E Statement No. 3), Mr. Cline explained that the Company conducted a customer-demand ACOS, a Peak & Average ACOS, and an Average ACOS. He also explained that the allocation of revenue was based on the Peak & Average ACOS, and that is consistent with the Order issued at Docket No. R-2020-3018835, and that he agrees on that basis to use the Peak & Average ACOS. However, he did not address that the ALJ preferred the Customer-Demand ACOS, and given the correction to the Customer-Demand method here, I strongly disagree with Mr. Cline that the Peak-And-Average is "consistent" with the prior Commission order adopting the ALJ's decision because the ALJ stated the Customer-Demand method was "preferred" but for the error in that year's study, which, of course, has been corrected in this rate case. While Mr. Cline did not attempt to allocate additional revenue requirement to the LDS/LGSS or Flex customers as Mr. Mierzwa did, Mr. Cline did recommend a reallocation of $600,000 from the RSS/RDS class to the SDS/LGSS class, and, more importantly, recommended that the first $20 million of any scale back of the Company's revenue requirement be applied to the RSS/RDS class. Mr. Cline's aggressive and unsupported shift of such a large amount of revenue must be ignored.

Q. WHY IS MR. CLINE'S SCALE BACK RECOMMENDATION UNACCEPTABLE?

A. I listed the revenue outcomes of the previous ten base rate case proceedings of Columbia in Table 1 of my direct testimony. Averaging all ten of those base rate cases, the revenue increase granted by the Commission either through an approved settlement or in the fully litigated 2020 case vs. the amount of revenue requested by Columbia was approximately 58.5 percent. If that is applied to the $82.2 million Columbia requested in this proceeding, the expected revenue increase granted by the Commission would be $48.1 million, or a scale back of $34.1 million. Mr. Cline not only wishes to give most of that benefit to the RSS/RDS class, but specifically states that the LDS/LGSS class should not receive any scale back. This discriminatory revenue allocation must be rejected. I recommend a proportional scale back of any revenue increase among all customer classes.

Q. WHAT DID OSBA WITNESSES MR. EWEN AND MR. KNECHT OBSERVE REGARDING COLUMBIA'S ACOS PROCESS?

A. Similar to Mr. Mierzwa and Mr. Cline, Mr. Ewen and Mr. Knecht explained the process the Company went through conducting a Customer-Demand ACOS, a Peak & Average ACOS, and an Average ACOS. They stated, "(t)he Company has consistently submitted two alternative ACOS models in its base rate filings stretching back to at least 2008, with a third version that is an average of the two. The models differ only in how mains plan costs are classified and allocated." OSBA Statement No. 1, 13:15-17

They continue, "The Company's "AVE" model is a simple average of these two methods. It should be recognized that the Company's two methods produce enormously divergent results." *Id.* 14:5-6

Q. DO MR. EWEN AND MR. KNECHT AGREE WITH THE COMMISSION'S FINDINGS AT DOCKET NO. R-2020-3018835 REGARDING MAINS ALLOCATION?

A. No. They state, "While we disagree with the Commission's finding regarding mains cost allocation in the last case, I accept the method employed by the Company in its P&A ACOSS for reasons of Commission precedent." *Id.* 15:1-3. However, in this case the facts have changed. If there was any precedent from that decision, it should be stated in a proper context which is: although the Customer-Demand ACOSS would have been preferred, it was not selected due to an error in that years' Customer-Demand study. Here, there are no errors in the Company's Customer-Demand ACOS, and I presented substantial evidence showing that the Customer-Demand ACOS is the only cost of service methodology based on actual cost-causation. The Commission is not bound by a previous decision made with different facts under different circumstances, particularly given the proper and qualified context of what the ALJ and Commission actually ruled.[3]

Q. DID YOU REVIEW THE TESTIMONY OF MR. KNECHT IN THE 2020 COLUMBIA RATE CASE?

A. Yes. Mr. Knecht states his agreement with the concept that mains costs are causally related to the number of customers. He states, "the common sense approach (to which I generally subscribe) is that more footage of mains must be installed to interconnect many small

[3] While I am not a lawyer, I have been advised by counsel that the Commission is not required by law to follow its decisions or "precedent" (a doctrine known as "*stare decisis*"). *PECO Energy Co. v. Pa. Pub. Util. Comm'n*, 791 A.2d 1155, 1166 (Pa. 2002) (*PECO*); *see also Baker v. U.S.*, 338 F. Supp. 331, 336 (Pa. E.D. 1972) ("[I]t is well settled that an administrative body is not bound by the rule of stare decisis, and inconsistency of its holding with prior holdings in and of itself does not make the decision capricious.") The Commission is only required to explain why a different result or conclusion is warranted where it rules differently in like circumstances. *PECO*, 791 A.2d at 1166.

customers than to connect one large customer." Docket No. R-2020-3018835, OSBA Statement No. 1, 16:5-7. I agree with Mr. Knecht on that point, especially in the rural areas of Columbia's service territory. Regarding the demand component of mains costs, Mr. Knecht argues that "because mains diameters must be sized to meet peak demand, the demand component of mains costs should be allocated only on peak demand." *Id.*, at 18:20-21. I also agree with Mr. Knecht on that point. On these key points, we are in agreement. Mr. Knecht did not make any statements in this case indicating that it is not appropriate to allocate mains costs based on the number of customers and peak design day demand. He acquiesces, and along with Mr. Ewen, accepts Columbia's use of the Peak & Average ACOS in this case for reasons of Commission precedence.

Q. WHAT IS YOUR SUMMARY OF THE REASONS THE OCA, I&E, AND OSBA WITNESSES OPINE TO USE THE PEAK & AVERAGE COST OF SERVICE STUDY?

A. Mr. Mierzwa, Mr. Cline, and Mr. Ewen and Mr. Knecht all based their agreement with the Company using the Peak & Average ACOS on the Commission Order from the 2020 Columbia rate case, an Order based on an ALJ recommendation to use the Peak & Average method even though "Customer Demand COSS would be the preferred method." RD at 394.

It is important to establish at this point that the Customer-Demand ACOS is the cost of service method that is based on actual cost causation, and if one ACOS is to be used it should be the Customer-Demand ACOS.

Q. WHY SHOULD MAINS BE ALLOCATED BASED ON THE NUMBER OF CUSTOMERS?

A. Natural gas pipelines are installed to provide service to customers. Unless all the customers are living in one massive apartment building, the distribution pipelines need to be extended across a company's distribution service territory. When more customers are added, more pipelines must be extended. It is a clear causal relationship that establishes why the customer component of the Customer-Demand ACOS is necessary. The Columbia System serves the suburbs of Pittsburgh along with numerous rural regions in Pennsylvania. Thus, the density of customers served by Columbia is less dense than if it served the major urban cities in the Commonwealth. This illustrates the reason that allocation of the cost of distribution mains should be done on a customer basis because customers in the less dense areas require more feet of natural gas distribution mains piping to reach them than customers situated in highly dense urban areas. Cost of gas mains are clearly dependent on the number of customers and installing mains to reach those customers. In the case of Columbia, the primary driver of its recent and current rate filings are the increasing capital costs of its distribution system due to extensions to add additional customers or the accelerated pipe replacement program underway to replace older pipe with new plastic gas piping. Both of these functions clearly are customer-driven and that supports allocating a portion of the distribution system costs on a customer basis.

Q. WHY SHOULD MAINS BE ALLOCATED BASED ON PEAK DEMAND AND NOT AVERAGE DEMAND?

A. One of the resources for rate design is the National Association of Regulatory Utility Commissioners ("NARUC") Gas Distribution Rate Design Manual (June 1989). The NARUC Manual on pages 23 and 24 states:

> Demand or capacity costs vary with the quantity or size of plant and equipment. They are related to maximum system requirements which the system is designed to serve during short intervals and do not directly vary with the number of customers or their annual usage. Included in these costs are: the capital costs associated with production, transmission and storage plant and their related expenses; the demand cost of gas; and most of the capital costs and expenses associated with that part of distribution plant not allocated to customer costs, such as the costs associated with distribution mains in excess of the minimum size.

Average demand is based on annual usage and is clearly identified as not appropriate to use as a basis for gas mains allocation. Peak design day demand is the appropriate allocator and the Customer-Demand ACOS is the appropriate study.

Q. IS THERE VALUE AT EXAMINING COMMISSION RULINGS OUTSIDE OF PENNSYLVANIA?

A. Yes. If we are to look outside of Pennsylvania at other Commission rulings, then examining a more recent New York case would show that National Fuel Gas Distribution ("NFGD"), Case No. 16-G-0257, NFGD allocated mains between Customer and Demand using a regression analysis and the zero-intercept radius methodology stating, "The first step in determining the allocation of Distribution Mains (Plant Account 376) is the split between Customer and Demand." Direct Testimony of Cost of Service and Rate Design Panel, 29:9-11. The Company performed a regression analysis, which determined that 58.56% of mains investment was customer related and 41.44% was demand related.

NFGD's customer-demand study was recommended by the Administration Law Judge (RD at 5) and adopted by the New York State Public Service Commission (Order at 88) in 2017.

Q. WHAT OTHER BASE RATE CASE DECISION APPROVED PEAK DEMAND FOR A GAS COMPANY'S MAINS ALLOCATION DETERMINANT?

A. The Maryland Public Service Commission ("MDPSC") recognized that distribution mains are demand related and should be allocated to all customers based on each class' contribution to peak demand. On June 13, 2016, the Order was issued in the Baltimore Gas & Electric ("BGE") base rate case No. 9406. The MDPSC approved BGE's ACOS method which bases the allocation on demand, using the non-coincident peak, which is the customer's highest demand during the year. "Distribution mains and associated O&M are classified as demand-related and allocated to all customer classes based on each class' contribution to the winter period total non-coincident peak ("NCP") demand (therms per hour)." Direct Testimony of David E. Greenberg, 31:1-3. This supports my point that in the Customer-Demand ACOS costs should be classified by peak demand, not average demand. The MDPSC reached the same conclusion three years later in BGE's 2019 gas rate case, stating that it "will accept the Staff's approach and its recommended GCOSS[4]". Case No. 9484, Order at 79. The Staff recommended "using the traditional single year Non-Coincident Peak ("NCP") method to determine the allocator for all four of customer classes." Order at 75, case No. 9484. Notably the MDPSC ignored the wish of the Office of People's Counsel ("OPC") witness Watkin's recommendation of using the Peak & Average cost of service method.

[4] Gas Cost of Service Study

Q. DO OTHER GAS DISTRIBUTION COMPANIES USE A CUSTOMER-DEMAND COST OF SERVICE MODEL?

A. Yes. In New York, Orange & Rockland ("O&R") produced an Embedded Cost of Service Study for its Gas Department in 2016 for its base rate filing, Case No. 14-G-0494, and again in 2021 for its base rate filing, Case No. 21-G-0073. In that study, O&R submitted Exhibit GRP-1, Schedule 1:

> Line 7, Distribution Demand ("Demand Component")
> The Distribution Demand ("Demand Component") consists of the balance of the distribution mains system not allocated to the customer component, and represents fixed costs related primarily to mains. It also includes distribution pressure governors and regulating equipment, used in distributing gas from the sellers to the firm classes of services. These costs are allocated to the firm classes in proportion to their maximum one-hour non-coincident use on a zero-degree day.
>
> Line 8, Distribution Customer ("Customer Component")
> The Distribution Customer ("Customer Component") consists of the distribution mains system that would be required to connect gas customers with a minimum predominant size pipe, regardless of their demand for gas. It is apportioned to the classes based on the number of services for each class.

Again, the Customer-Demand method is the ACOS that is based on cost causation, and should be accepted as the ACOS in this proceeding.

Q. IS THERE A STATUTE THAT PROHIBITS THE COMMISSION FROM CONSIDERING NEW METHODS DIFFERENT FROM THE PEAK & AVERAGE ACOS?

A. No. The Commission is free to improve on its past decisions based on new information and considerations. That is why I have misgivings about comments like Mr. Ewen's and

Mr. Knecht's that precedent dictates the Peak & Average ACOS method. As I explained above, they are wrong.

Q. ARE CONDITIONS TODAY THE SAME AS THEY WERE IN 2020?

A. No. Columbia filed that base rate case on April 24, 2020, at the beginning of the Covid-19 pandemic's arrival in the Commonwealth. Vaccines were not available, hospitalization rates were sky high, sufficient ventilators could not be found, and unemployment shot up to record highs. At the time, the Commonwealth had a "maximum of 10" order, restricting gatherings to no more than ten attendees. To illustrate the pandemic's dramatic effect on the economy, I will refer to Mr. Rubin's direct testimony, a witness for the OCA in the 2020 Columbia rate case, where, in referencing the economy and unemployment rates, Mr. Rubin stated, "Data for Pennsylvania show an even more serious result. The U.S. Census Bureau has been conducting weekly surveys of households since April 23. In the first week, 46.9% of Pennsylvania households reported a loss of at least some employment income since March 13. By the eleventh week of the survey (the week ending July 14), that had risen to about 50% of households" (R-2020-3018835, OCA Statement 1, 13:13-17) For that, and other reasons, the OCA witnesses recommended that the Commission deny Columbia any rate increase. Several other parties to that case, CAUSE-PA, Columbia Industrial Intervenors, and Community Action Association of Pennsylvania, also recommended that the request be denied in its entirety. In that base rate proceeding, that parties held extreme positions and settlement of the rate increase request was not achieved through the negotiation process. This was a significant departure from the prior eight base rate cases going back to 2008, that I have personally been involved in. Settlement

discussions of the prior cases successfully resolved the revenue requirement issue, which illustrates the success of the give-and-take process of successful negotiations where all parties make compromises. Unfortunately, because of the extreme positions of the parties in 2020, the revenue requirement was fully litigated and the even the ALJ recommended "the Commission deny this base rate request, keep in place the rates, charges and tariff provisions, having been previously approved, and keep the current DSIC charge in place." RD at 51. She did make an alternative recommendation recognizing that the Commission may wish to consider an alternative to a flat-out denial.

Q. WHAT DID THE UNIQUE AND UNPRECEDENTED ECONOMIC CLIMATE CAUSED BY THE COVID-19 PANDEMIC LEAVE US WITH TODAY?

A. Unfortunately, Columbia based its revenue allocation on the recommendation in the only case since 2008 where the allocation was result of litigation, and ignored the other nine base rate cases where revenue allocation was determined by settlement through negotiation and compromise. It used the peak and average COSS even though the ALJ herself acknowledged that were it not for "errors", the Customer-Demand COSS would be the preferred method. Therefore, in absence of "errors" (there are none in the current Customer-Demand COSS) that study should be the preferred method. Examining the revenue allocations that Mr. Johnson produced using the Customer-Demand study, results with an allocation that is diametrically opposed to the allocation of the peak & average study, as illustrated in Table R-1

Table R-1: Comparison of COSS Results
Rate of Return at Current Rates

Class	Columbia P&A	Columbia C-D	Columbia Ave
TOTAL COMPANY	6.130	6.130	6.130
RSS/RDS	7.970	4.674	6.091
SGS/DS-1	6.692	6.984	6.836
SGS/DS-2	6.677	15.689	9.959
SDS/LGSS	5.390	18.226	9.417
LDS/LGSS	1.677	18.684	5.543

This illustrates the drastic differences that result based on which ACOS study is selected.

Q. WHAT IS THE SUMMARY OF YOUR TESTIMONY?

A. Rates must be set based on the cost of service and cost of service is based on cost causation (the "polestar" of cost of service). This is not just my opinion; it is the result spelled out in the Commonwealth Court decision in the *Lloyd* case[5]. The Customer-Demand cost of service study is the only cost of service study in this case that is based on cost causation, and, therefore, the allocations based on the Customer-Demand ACOS presented by the Company in Exhibit 111, Schedule 1, must be used. Mr. Johnson's recommendation of allocating revenue using a study that does not adhere to cost causation principles must be rejected. Basing revenue allocation on Commission precedence that resulted from an order that was issued during the most bizarre year of the pandemic that skews the historically balanced revenue allocation and burdens all other classes to solely benefit the residential class is wrong. This unjust and unfair situation must be corrected and if the parties cannot reach a settlement on this issue than the Commission must direct that the revenue allocation

[5] *Lloyd v. Pa. P.U.C.*, 904 A.2d 1010 (Pa. Cmwlth. 2006)

of the Customer-Demand ACOS as shown in Exhibit 111, Schedule 1 be used. If the Commission wishes to provide a balance by giving something to all parties, then the revenue allocation of the Company's Average study (Exhibit 111, Schedule 3) should be used.

Q: DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?

A. Yes.

BEFORE THE
PENNSYLVANIA PUBLIC UTILITY COMMISSION

Pennsylvania Public Utility Commission	:	
	:	Docket No. R-2022-3031211
v.	:	
	:	
Columbia Gas of Pennsylvania, Inc.	:	

PSU Statement No. 1-SR

SURREBUTTAL TESTIMONY OF JAMES L. CRIST, P.E.
ON BEHALF OF
THE PENNSYLVANIA STATE UNIVERSITY

Dated: July 26, 2022

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS, AND ON WHOSE BEHALF YOU ARE TESTIFYING.

A. I am James L. Crist, President of Lumen Group, Inc. I previously presented direct testimony and rebuttal testimony and now I am presenting surrebuttal testimony on behalf of The Pennsylvania State University ("Penn State" or "PSU" or the "University").

Q. WHAT ARE THE ISSUES YOU WILL ADDRESS IN THIS SURREBUTTAL TESTIMONY?

A. Specifically, in my surrebuttal testimony I will review comments made by Office of Consumer Advocate ("OCA") witness Mr. Mierzwa, the Bureau of Investigation & Enforcement ("I&E") witness Mr. Cline, Office of Small Business Advocate ("OSBA") witnesses Mr. Ewen and Mr. Knecht and Columbia Gas of Pennsylvania, Inc. ("Columbia" or "Columbia Gas" or the "Company") witness Mr. Johnson, all concerning my allocated cost of service study ("ACOS") recommendations and my discussion regarding prior Pennsylvania Public Utility Commission ("Commission") orders on Columbia's ACOS. Their testimony reinforces my observations that utilization of the Peak & Average ACOS is not based on cost causation. They all base their positions on the Commission ruling in the 2020 Columbia case and ignore the engineering basis that is the causal factor in gas mains design, which is unacceptable.

Q. WHAT REASONS DOES OCA WITNESS MR. MIERZWA STATE TO DISAGREE WITH YOUR RECOMMENDATION TO UTILIZE THE CUSTOMER-DEMAND ACOS?

A. He raises two reasons to oppose my recommendation to utilize the Customer-Demand ACOS. In his rebuttal testimony (OCA Statement 3-R), Mr. Mierzwa first observes that in the Company's Customer-Demand ACOS, the mains costs are allocated 45 percent based on demand and 55 percent based on the number of customers but in the Company's Peak & Average ACOS, the mains costs are allocated 50 percent based on demand and 50 percent based on annual throughput. He then states, "it is not clear why, if mains are sized based on demands as Mr. Crist claims, the Customer-Demand method should be utilized in this case when it results in less of an allocation of mains costs based on demand than the Peak & Average method." *Id.,* 9:19-10:2. Mr. Mierzwa appears to advocate increasing the allocation based on demand from 45% to 50% in Columbia's Customer-Demand ACOS. I do not have an objection to that. However, it appears that Mr. Mierzwa missed my main point regarding the choice of allocation methods of the ACOS. The difference in the allocation based on peak demand is minimal (45% in the Customer-Demand ACOS and 50% in the Peak & Average ACOS) but the real difference between the two ACOS lies in the second components which are drastically different. Both studies have the peak demand as one component but in the Customer-Demand ACOS costs are also allocated based on the number of customers in a rate class, whereas in the Peak & Average ACOS costs are also allocated based on the average demand, which is equivalent to the annual throughput. I believe, and the engineering evidence[1] demonstrates the fact, that annual throughput has nothing to do with how Columbia determines the size of the distribution mains in its system.

[1] Exhibit PSU-1 consists of Columbia responses to data requests PSU 1-001, PSU 1-002, PSU 1-006, and PSU 1-011. All addressed the engineering procedures used in design, construction and sizing of distribution main lines.

Q. WHAT IS THE SECOND REASON MR. MIERZWA DISAGREES WITH YOUR RECOMMENDATION TO RELY ON THE CUSTOMER-DEMAND ACOS?

A. Mr. Mierzwa said that the Commission specifically approved the use of the Peak & Average allocation methodology. I understand that was the case, but it was clearly stated as being qualified or contingent upon errors existing in that study in the Final Order at Docket No. R-2020-3018835 that "we are not persuaded to reverse the ALJ's Recommended Decision that adopted the OCA's P&A ACOS and methodology ***in this proceeding***." Final Order at 211 (emphasis added). Mr. Mierzwa ignores that the ALJ said the method I recommend is preferable but for errors in Columbia's then-model so he continues to speak out of proper context. The wording was clear that the Commission was issuing a ruling that applied to one case and not issuing a policy statement or regulation that must be applied without question in every future case. We are in a new proceeding with the opportunity to consider new evidence such as the facts I presented in my direct testimony demonstrating that only the Customer Demand ACOS is based on cost causation, and the Peak & Average ACOS is not.

Q. DOES MR. MIERZWA BELIEVE THAT THE SECOND COMPONENT OF THE ACOS SHOULD BE BASED ON THE NUMBER OF CUSTOMERS?

A. No. He does not believe that the second component of the allocation should be based on number of customers. Instead, he believes it should be based on annual throughput.

Q. WHAT IS THE IMPACT OF MR. MIERZWA'S RECOMMENDATION OF THE PEAK & AVERAGE ACOS?

A. Because the results of the two ACOS are significantly different, consideration of the impact on each customer class is important to avoid a skewed impact of a rate increase. Mr. Mierzwa's recommendation would have Small Delivery Service and Large Delivery Service users receive a 28.2% increase, which is neither good for those customers, Pennsylvania jobs, or attracting business to the Commonwealth. In contrast, Mr. Mierzwa recommended only a 10.5% increase for the residential classes. (OCA Statement No. 3, p. 11, Table 3). In previous rate cases through 2020, Columbia attempted to balance the results of the two ACOS methods by use of the Average ACOS, in order to maintain fairness.

Q. WHAT ARE THE TWO COMPONENTS OF THE CUSTOMER-DEMAND ACOS AND THE PEAK & AVERAGE ACOS?

A. In the Customer-Demand method the allocation is based on peak demand (the first part) and on number of customers (the second part). In the Peak & Average method the allocation is based on peak demand (the first part) and the average throughput (the second part). To make this clear and simple, Mr. Mierzwa and I agree that the significant component of the cost of Columbia's distribution system is the cost of gas mains, and we also agree that one of the two components used in the ACOS is the peak demand. We differ in that I have proven that based on cost causation principles, the second component must be the number of customers and not annual throughput. As I explained in my direct testimony, the cost of gas mains depends on the design of the piping. There are two

physical measurements that Columbia's engineering department calculates when designing its piping system, the diameter of the pipe and the length of the pipe. I included exhibits with my direct testimony setting forth responses from Columbia regarding how its engineers design pipe and what data they use in that design process. For each pipe, the data used in the design is the expected peak load because that determines the diameter (how "fat" the pipe must be). It must be fat enough to carry enough gas during the coldest days of the winter to satisfy the needs of all of its customers. The other data used are the location of and number of customers because that determines the length of the pipe. It is easy to understand that Columbia has to install enough feet of pipe to connect to all its customers. What is significant when deciding if the ACOS is based on cost causation is that at no time during the engineering design process do the engineers use the annual throughput (also called "average demand" or the "Average" component of the Peak & Average ACOS). The Peak & Average method is not based on cost causation because costs are determined by design of gas mains, and design of gas mains does not rely upon annual throughput like the average demand component of the Peak & Average ACOS, but instead on the number and location of customers, which the Customer-Demand does consider. That is why the Customer-Demand ACOS must be used in this proceeding.

Q. WHY ELSE DOES MR. MIERZWA BELIEVE THE PEAK & AVERAGE STUDY SHOULD BE USED?

A. Mr. Mierzwa stated that in last year's Columbia case the Commission's Order said:

> …we remain of the opinion that although mains serve customers, it is the throughput that determines the mains investment, not the number of customers served. (Order at 217).

OCA Statement 3-R 10:10-13. The Final Order was 275 pages long, plus a table of contents and tables at the end that showed the Commission's allowed revenue increase. In fact, there were 31 pages in the Order that covered the topic of ACOS, and there was significant discussion of the merits of not only the Peak & Average ACOS, but also the Customer-Demand ACOS. It would be misleading to suggest that all those arguments can be fairly and accurately summarized in the fragment of one sentence that Mr. Mierzwa included. Because it is the only point he stated, it can easily be put into proper context removing his spinning of the decision, picked apart and analyzed piece by piece. First, do mains serve customers? Absolutely, and the Commission does "remain of the opinion" that they do. To suggest that all those miles of pipe are in the ground not to serve customers would be foolish. Next, is it the throughput that ***determines the mains investment***? Absolutely not. It is the peak demand, not the annual throughput, that determines the mains investment. In her recommended decision, the ALJ stated that the Customer-Demand ACOS would be the preferred method, however, due to an "error"[2] she recommended use of the Peak & Average method. The Commission simply approved her recommendation. In this proceeding, however, the Commission must not ignore the specific evidence presented on the determinants of mains investments; nor should it ignore that cost of service based on cost causation is the polestar of ratemaking as described in *Lloyd v. Pennsylvania Public Utility Commission*, 904 A.2d 1010 (Pa. Cmwlth. 2004). All of the data collected from prospective customers used to design Columbia's pipeline system focuses on the peak demand and location of the customer, not the annual or average consumption.

[2] The "error" was Mr. Mierzwa's characterization of the Company's categorization of distribution system piping by pressure, which Mr. Johnson did not do in the ACOS calculations in this case.

Q. WHAT DID THE BUREAU OF INVESTIGATION AND ENFORCEMENT WITNESS MR. CLINE COMMENT ABOUT THE COMMISSION ORDER IN THE LAST COLUMBIA BASE RATE CASE?

A. Similar to Mr. Mierzwa, in his rebuttal testimony (I&E Statement No. 3-R) Mr. Cline referenced the Final Order in the 2020 Columbia base rate case and he characterized my analysis of the Order as "inaccurate and misleading." *Id.*, 4:3-4. However, I note that Mr. Cline, other than offering his generalized rhetoric, did not identify any statement of mine that he believed was inaccurate, and did not identify any of the direct quotations from the Order as inaccurate. Although he may not agree with my logical presentation, his disagreement does not make my testimony "misleading".

Q. HOW DO YOU ADDRESS THE FIRST CITATION FROM THE 2020 ORDER THAT MR. CLINE PRESENTED?

A. He first presented the following quote:

> Based on our review of the record, and as noted by the ALJ, we have consistently used the Peak & Average methodology for the allocation costs for NGDCs. In this regard, we find that the Customer-Demand method and the Average ACCOSS, which depends on the Customer-Demand methodology, would be inconsistent with Commission precedent and generally accepted principles for NGDCs because they both contain customer cost components.

Id., 4:12-19 (quoting 2020 Order at 215).

As I explained in my Rebuttal testimony, the only reason Mr. Cline stated for supporting the use of the Peak & Average ACOS in this case was alleged Commission precedence. When discussing the Peak & Average ACOS in his direct testimony he states:

> "This methodology was accepted by the Commission in the Company's 2020 base rate case"

(I&E Statement No. 3, 11:10-11) and

> "Consistent with the Commission's Order from the last base rate case, discussed above, the Company utilized the second ACOS study sponsored by Mr. Johnson, which is the peak and average study, presented on Columbia Exhibit No. 111, Schedule No. 2 to allocate the proposed revenue increases."

Id., 11:17-20. Mr. Cline conducted no independent analysis of any ACOS and did not even validate the ACOS he supports. He simply cited that the Commission approved the Peak & Average ACOS in the last case and that was the only reason he cited for supporting it in this proceeding.

Q. HOW DO YOU ADDRESS THE SECOND CITATION FROM THE 2020 ORDER THAT MR. CLINE PRESENTED?

A. He then presented the following quote in his rebuttal testimony:

> "we find that the Peak & Average allocation methodology is the most appropriate allocation methodology to use in this proceeding because it is based on the premise of load-based investment."

Cline Rebuttal, I&E Statement 3-R, 4:20-24 (quoting 2020 Order at 218).

I will address two points in this excerpt from the Final Order. First is the wording "in this proceeding", which means exactly that. The Commission was not ordering that all future natural gas utility filings use the Peak & Average ACOS. It made a ruling that applied in one proceeding to the specific facts and studies presented in that proceeding, and made that ruling in large part due to the recommendation of the ALJ who stated concern with the so called "errors" in the Company's Customer-Demand ACOS. I explained in my direct testimony in this case that the "errors" were not mathematical mistakes but instead a characterization that was used by the OCA witness who was advocating a different ACOS methodology. The ALJ actually stated that the preferred method was the Customer-

Demand ACOS. In stating that, the ALJ showed that she was not limited by previous Commission decisions and that cases should be decided based on the facts presented in that case. The second point to address is the "premise of load-based investment." I have soundly addressed in this and my prior testimony the misunderstanding that the investment in gas mains of a distribution system is based on annual load. It is not. This is not an opinion but a fact proven by actual evidence. There is nothing in the engineering, design, or construction of gas mains that is based on annual loads. Gas mains are engineered to satisfy two requirements -- that they are sized large enough to meet peak demand and that they are constructed long enough to connect to customers. Mr. Cline continues to rely solely on the 2020 Commission Order in every statement he makes disagreeing with the concept that the Customer-Demand ACOS is the appropriate method to use in this proceeding. He said:

> "Mr. Crist's insistence that costs should be allocated based on the customer-demand methodology because of how the Company stated the system is designed is not consistent with the Commission's historic determination of cost causality." Cline Rebuttal, I&E Statement 3-R, 5:10-13

> "The Commission stated on page 217 of the 2020 Columbia Order that 'we remain of the opinion that although mains serve customers, it is the throughput that determines the type of main investment, not the number of customers served.'" *Id.*, 5:16-18

> "The Commission should not reverse itself and has previously reflected the proper recognition that distribution mains are built on the basis of year-round demands as well as peak demands. Mr. Crist did not provide any reasonable rationale to accept a methodology that the Commission rejected recently." *Id.*, 6:13-16

Mr. Cline, who is not a professional engineer, conducted no engineering analysis of how a gas distribution system is planned, designed, and built, and in his third quotation above refuses to find rationales that are based on hard engineering and science to be "reasonable".

Q. IS MR. CLINE'S EXPLANATION OF YOUR RATIONALE TRUTHFUL?

A. No, he makes a single sentence that deliberately mischaracterizes my position. He states,

> "Mr. Crist's rationale for supporting the customer-demand methodology is his claim that the Company uses delivery pressure as the only data used in gas main design and sizing (PSU St. No. 1, pp. 15-17)." *Id.*, 5:3-5

Unbelievably, Mr. Cline reviewed three pages of my testimony and then determined that I said that the Company uses delivery pressure as the only data used in gas main design and sizing. That is simply not true. Page 14 of my Direct testimony where I provided the Company's response to PSU 1-001, states that pressure is indeed one of the factors considered but also lists the length of main, and load information in Mcf/hr. In my support of the Customer-Demand ACOS I have explained that the number of customers and where they are actually located is used to determine the length of the pipe, and the load information determines the demand. At the bottom of page 15 of my Direct testimony, I provided the response to PSU 1-006 that explains that the "connected load of a customer moving into an existing facility would be based upon the total rating (either in BTSs-British Thermal Units, or cubic feet of gas per hour) of the gas appliances to be used by the customer." On page 16 of my Direct testimony, I continue by providing the data request response to PSU 1-011 and the Company explains that "total BTU load" is what Columbia uses to design its distribution system. On page 17, I provided substantial testimony citing my twenty-plus years' experience working for natural gas distribution companies, along with my Professional Engineering credentials, and explained that annual throughput is never used in the design of gas mains and that the demand as determined by the connected load is always used to design gas mains. The Customer-Demand ACOS is the only study performed by Columbia that correctly considers cost causation in determining cost

allocation. Apparently, Mr. Cline is content to repeat history and conflate my testimony even when presented with new engineering facts and evidence. His objections to the use of the Customer-Demand ACOS must be rejected.

Q. WHAT DID OSBA WITNESSES MR. EWEN AND MR. KNECHT OBSERVE REGARDING YOUR DIRECT TESTIMONY RECOMMENDING THE CUSTOMER-DEMAND ACOS?

A. They again explained the process the Company went through, conducting a Customer-Demand ACOS, a Peak & Average ACOS, and an Average ACOS, and that the Company relied on recent Commission precedent[3] when using the Peak & Average ACOS to develop its revenue proposal in this proceeding. They state, "We agree with Mr. Crist that economies of scale exist for serving larger customers. For reasons of Commission precedent, however, we rely on the P&A ACOSS as the cost basis for revenue allocation and rate design." (OSBA Statement 1-R, 2:6-8) Messrs. Ewen and Knecht's stating "reasons of Commission precedent" will be addressed in briefing by Penn State's attorneys. My view is that simply because the Commission did not choose the Customer-Demand ACOS in the 2020 Columbia Order, does not mean as a general principle the Commission will not recognize the value and accuracy of the Customer-Demand ACOS and its reliance on cost causation as its foundation, particularly when here we have uncontroverted evidence supporting use of the Customer-Demand ACOS that was not present in the 2020 proceeding. It appears that Messrs. Ewen and Knecht did not wish to advance a position

[3] My use of the word precedent in this testimony is solely to reflect the positions of the witnesses who used that word. As stated in my prior testimony, PSU's attorneys advise that PUC decisions are not "precedential."

different from the 2020 Commission decision and therefore produced a revenue allocation based on the Peak & Average method.

Q. WHAT POSITION DID MR. KNECHT PRESENT IN THE 2020 PECO GAS CASE?

A. In that proceeding (Docket No. R-2020-3018929) when addressing the topic of gas mains cost allocation Mr. Knecht testified,

> "In my view, cost causation for any particular main segment is causally related to the peak demand from customers downstream of that segment. Average demand is irrelevant, since the main must have sufficient diameter under sufficient pressure to meet the peak requirements of downstream customers. Cost causation for the overall system must reflect the topology of the distribution system, notably the nature and length of all the individual main segments needed to serve the customer base." OSBA Statement 1-R, 5:5-11

I am in agreement with Mr. Knecht that the peak demand and number and location of customers are the causal factors that determine investment in gas mains, and because of that, the Customer-Demand ACOS is the method that most appropriately allocates distribution system costs.

Q. WHAT DID COLUMBIA WITNESS MR. JOHNSON OBSERVE REGARDING YOUR DIRECT TESTIMONY RECOMMENDING THE CUSTOMER-DEMAND ACOS?

A. While Columbia presented its recommended revenue allocation based on the Peak & Average ACOS due to Commission precedent, Mr. Johnson did acknowledge,

> "it seems possible that Columbia's separation by operating pressure of customers, design day volumes and throughput that made up the

> mains allocation factors in that case was the "error" identified by the ALJ and that because Mr. Mierzwa's Peak and Average study was the only study presented that did not first separate by operating pressure, that may have been the deciding factor in the Commission's Decision to use the Peak and Average study in that case." Statement 6-R, 5:18-6:1

He then continues, "The Company did not separate of [sic] mains by operating pressure in this case." Id, 6:1-2. Therefore, in this proceeding, Mr. Johnson fixed the "error" present in the past, and the Commission is free to select the Customer-Demand ACOS he conducted as the revenue allocation method. Mr. Johnson then points out what I would call a serious flaw or error in the Peak and Average ACOS. Specifically, the Peak and Average ACOS assigns approximately 13 miles of pipe to each LDS/LGSS customer even though main extensions of only 0.04-1.4 miles of pipe were needed to connect the ten largest LDS/LGSS customers to Columbia's distribution system. Mr. Johnson explains that, "The Company believes in light of the mains cost allocated to the LDS/LGSS rate class, using the Peak and Average as the sole basis of determining the allocation of revenue is not fair or reasonable." *Id.*, 12:5-7

Q. ALL WITNESSES THAT DISCUSSED THE ACOS DID NOT CHALLENGE THE METHOD THE COMMISSION SELECTED IN THE 2020 CASE. ARE YOU IGNORING THE COMMISSION'S DECISION?

A. No, I am not ignoring the words of the Commission in its Order in the 2020 case. I have read and reread the order and identified the rationale cited by the Commission in reaching its decision. The Commission stated: "the Peak & Average allocation methodology is the most appropriate allocation methodology to use in ***this*** proceeding because it is based on the premise of load-based investment." (Final Order at 218; emphasis added). Focusing

on the words "use in this proceeding" tells me that the Commission was open to and will consider any new facts or evidence to be presented in the future, and that one ruling made in 2020 was not intended to shut the door on presenting new evidence and arguments in the future. When the Commission stated, "based on the premise of load-based investment" it directed me to examine the actual causal factors of gas mains investment, and I did that examination not based on whims, or class preferences, or non-scientific means but instead I dug into the engineering principles that gas distributions systems are based on, and more specifically on which Columbia Gas' distribution system are based. I note that of the other witnesses that discussed the ACOS, Mr. Mierzwa, Mr. Ewen and Mr. Knecht are not engineers, and that while Mr. Cline has a degree in Civil Engineering, he has not performed any natural gas pipeline engineering design work during his career. Because I am a Registered Professional Engineer in the Commonwealth (license number PE029041E) and because in my decades of employment with several major natural gas utilities I have reviewed dozens of natural gas main line extension engineering studies, I know the methods that are used to design piping systems. Moreover, in my Direct testimony I presented the specific evidence from Columbia that shows how Columbia's mains are designed. The Commission was seeking a reason to consider an ACOS method that is based on cost causation to comply with the polestar of ratemaking and I have provided such evidence specific to Columbia. None of the other witnesses I have discussed have produced any evidence that the Peak & Average method is based on cost causation or facts specific to Columbia's design of gas mains.

Q. HAS THE COMMISSION STATED AS POLICY THAT THE PEAK & AVERAGE METHOD IS THE ONLY ACCEPTABLE ACOS METHODOLOGY?

A. No, and my critics are silent on recognizing this point. In the recent PECO Gas case (Docket No. R-2020-3018929) the Commission rejected the Peak & Average ACOS method that was proposed by the OCA and selected the Average & Excess ACOS method, which places greater weight on excess demand and lesser weight on average demand. When requested by the OSBA that the Commission affirm an ACOS methodology as the standard for future natural gas distribution company proceedings, the Commission declined to do so stating:

> "we find that development of a regulation for determining the allocation of mains costs distribution is inappropriate at this current procedural stage of the case. ***We agree with PAIEUG that the inherent distinctions between utilities and rate cases may result in different methodologies to be reasonable for different reasons***. In other words, the best-suited ACCOSS may depend on the circumstances of the situation on a case-by-case basis." *PUC et al v.* PECO, Docket Nos. R-2020-3018929 *et al*, Opinion and Order at 230-31 (Order entered June 22, 2021) (emphasis added), *reconsideration denied,* (Opinion and Order issued August 26, 2021).

While Penn State's attorneys will present arguments in briefing, I can understand the clear language of this Order that the Commission realizes that different ACOS methods exist and just because it selected a particular method for one utility in one case does not cast in stone and mandate that methodology in all cases for all time. The Commission is free to decide based on the merits and evidence in this proceeding.

Q. MESSRS. EWEN AND KNECHT OBSERVE THAT YOU DID NOT SUBMIT A REVENUE ALLOCATION OR RATE DESIGN BASED ON THE CUSTOMER-DEMAND ACOS. WHAT DO YOU RECOMMEND?

A. I recommend that the Company's Customer-Demand ACOS be used as the primary basis to determine the revenue allocation. I have used the Company's Customer-Demand ACOS and prepared a revenue allocation based on the results which I am including as Exhibit PSU-SR-1. This exhibit contains three scenarios that I discuss below. I recommend adoption of the third scenario as the most just, reasonable, and non-discriminatory rate design based on cost causation principles. In that exhibit I have determined revenue allocation under several scenarios.

Q. HOW DID YOU TREAT MLDS AND FLEX CLASSES?

A. In all my scenarios, I did not alter the Company's recommendation for revenue allocation to the MLDS and Flex classes. I accept and agree with the Company's rationale that the MLDS class customers that are generally proximate to a transmission pipeline are overpaying based on the amount of rate base allocated to the class, therefore, the Company allocated no revenue increase to them. I also agree with the Company's treatment of the Flex class customers, only increasing the revenue allocation by the amount of service charge increases in this case. The Company provided convincing evidence that it thoroughly analyzes competitively situated customers and negotiates amounts necessary to retain their patronage and such agreements do not allow for increases.

Q. WHAT DOES THE TERM UNITIZED RETURN MEAN AS USED IN EXHIBIT PSU-SR-1?

A. The unitized return is the ratio of the class rate of return on rate base to the Company's overall rate of return on rate base. A unitized return greater than 1.0 indicates a class is

overpaying, while a unitized return less than 1.0 indicates a class is underpaying. In my first example there is no class cross-subsidization and the class unitized returns are all similar at 1.02.

Q. WHAT IS THE FIRST SCENARIO?

A. Using the Customer-Demand ACOS and bringing each of the customer groups to similar class rates of return results in the SGS/DS-2, SDS/LGSS, and LDS/LGSS classes receiving a decrease. I do not believe it is practical or realistic to adjust class revenues to provide decreases and I am not recommending that, but have included it to illustrate the dramatic differences in results that depend on the selection of an ACOS.

Q. WHAT IS THE SECOND SCENARIO?

A. In my next scenario I did not allow any decrease in revenue collection from the SGS/DS-2, SDS/LGSS, and LDS/LGSS classes, however this resulted in the RSS/RDS class bearing most of the increased revenue requirement, and I did not find that acceptable.

Q. WHAT IS THE RECOMMENDED SCENARIO?

A. In my third scenario I balanced the increases by accepting the OSBA's recommendation for the SGS/DS-1 and SGS/DS-2 classes. I then increased the LDS/LGSS class by 7.5675%, which represents 75% of the Company's overall percentage increase it requested. I then assigned revenue to the SDS/LGSS class to achieve a similar unitized return as the LDS/LGSS class, which is still high at 2.74. While in theory, all classes should have the same unitized return of 1.0, in practice that is impossible to achieve due to the reason

mentioned previously of not allowing any class revenue decreases. The remainder of the revenue increase was assigned to RSS/RDS. That class only has a unitized return of 0.81 and the percentage increase assigned is only 0.39% higher than the Company's proposed revenue increase to the residential class, which will not impose an undue hardship. Using the Customer-Demand ACOS, and making the appropriate adjustments in my recommended scenario as described provides a fair, just and reasonable revenue allocation based on cost causation.

Q. WHAT IS YOUR RECOMMENDATION REGARDING RATE DESIGN?

A. I accept the Company's rate design for the SDS/LGSS and LDS/LGSS classes. I offer no opinion on the rate design for the other customer classes.

Q. WHAT IS YOUR RECOMMENDATION REGARDING SCALE BACK?

A. If the Company's requested revenue increase is not awarded but a lesser amount is determined to be appropriate then the allocation of that scaled back amount should be in similar proportion as the allocations in my recommended scenario. I oppose the scale back proposed by Mr. Cline that disproportionately adjusts the revenue allocation, and further increases class cross-subsidization. Such an allocation is not just and reasonable.

Q. COULD YOU PLEASE SUMMARIZE YOUR TESTIMONY?

A. To ensure that the correct cost allocation of the revenue requirement is based on cost causation, the revenue allocations must be based on the Customer-Demand ACOS

presented by the Company. The recommendation of allocating revenue using the Peak & Average study that does not adhere to cost causation principles must be rejected. The revenue allocation I present in this testimony that is based on the Customer-Demand ACOS should be adopted.

Q: DOES THIS CONCLUDE YOUR SURREBUTTAL TESTIMONY?

A. Yes.

Exhibit PSU-SR-1: Recommended Revenue Allocation

ALLOCATED COST OF SERVICE
CUSTOMER/DEMAND

LINE NO.	ACCOUNT TITLE	TOTAL COMPANY	RSS/RDS	SGS/DS-1	SGS/DS-2	SDS/LGSS	LDS/LGSS	MLDS	FLEX
	(A)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
	I: REVENUE ALLOCATION BASED ON C-D ACOS	$	$	$	$	$	$	$	$
1	PROPOSED REVENUE – CUSTOMER/DEMAND ALLOCATION	896,657,347	716,700,000	78,200,000	58,350,000	23,150,000	14,001,892	1,971,082	4,284,374
2	TOTAL REVENUE - CURRENT	814,505,439	598,982,336	73,587,830	75,811,926	35,667,652	24,214,116	1,970,857	4,270,723
3	REVENUE INCREASE	82,151,908	117,717,664	4,612,170	(17,461,926)	(12,517,652)	(10,212,224)	225	13,651
4	RATE OF RETURN EARNED ON RATE BASE	7.880%	8.052%	8.033%	8.041%	8.024%	8.036%	157.627%	-1.562%
5	UNITIZED RETURN	1.00	1.02	1.02	1.02	1.02	1.02	20.00	(0.20)
6	INCREASE PERCENTAGE	10.09%	19.65%	6.27%	-23.03%	-35.10%	-42.17%	0.01%	0.32%
	II: REVENUE ALLOCATION WITH NO DECREASES								
7	PROPOSED REVENUE – C/D BUT NO DECREASES	896,657,347	681,120,368	73,587,830	75,811,926	35,667,652	24,214,116	1,971,082	4,284,374
8	TOTAL REVENUE - CURRENT	814,505,439	598,982,336	73,587,830	75,811,926	35,667,652	24,214,116	1,970,857	4,270,723
9	REVENUE INCREASE	82,151,908	82,138,032	0	0	0	0	225	13,651
10	RATE OF RETURN EARNED ON RATE BASE	7.880%	6.998%	6.992%	14.860%	20.299%	18.642%	157.627%	-1.562%
11	UNITIZED RETURN	1.00	0.89	0.89	1.89	2.58	2.37	20.00	(0.20)
12	INCREASE PERCENTAGE	10.09%	13.71%	0.00%	0.00%	0.00%	0.00%	0.01%	0.32%
	III: REVENUE ALLOCATION BALANCED (RECOMMENDED)								
13	TOTAL REVENUE - BALANCED	896,657,348	661,505,617	80,337,830	83,911,926	38,600,000	26,046,520	1,971,082	4,284,374
14	TOTAL REVENUE - CURRENT	814,505,439	598,982,336	73,587,830	75,811,926	35,667,652	24,214,116	1,970,857	4,270,723
15	TOTAL REVENUE INCREASE	82,151,909	62,523,281	6,750,000	8,100,000	2,932,348	1,832,404	225	13,651
16	RATE OF RETURN EARNED ON RATE BASE	7.880%	6.327%	8.727%	19.367%	22.579%	22.559%	157.627%	-1.562%
17	UNITIZED RETURN	1.00	0.81	1.11	2.46	2.74	2.74	20.00	(0.20)
18	INCREASE PERCENTAGE	10.09%	10.44%	9.17%	10.68%	8.22%	7.57%	0.01%	0.32%