

**EXH. RJA-6Tr  
DOCKETS UE-190529/UG-190530  
UE-190274/UG-190275  
2019 PSE GENERAL RATE CASE  
WITNESS: RONALD J. AMEN**

**BEFORE THE  
WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION**

**WASHINGTON UTILITIES AND  
TRANSPORTATION COMMISSION,**

**Complainant,**

**v.**

**PUGET SOUND ENERGY,**

**Respondent.**

**Docket UE-190529  
Docket UG-190530 (*Consolidated*)**

**In the Matter of the Petition of**

**PUGET SOUND ENERGY**

**For an Order Authorizing Deferral  
Accounting and Ratemaking Treatment  
for Short-life IT/Technology Investment**

**Docket UE-190274  
Docket UG-190275 (*Consolidated*)**

**PREFILED REBUTTAL TESTIMONY (NONCONFIDENTIAL) OF**

**RONALD J. AMEN**

**ON BEHALF OF PUGET SOUND ENERGY**

**REVISED  
JANUARY 29, 2020**

**JANUARY 15, 2020**

**PUGET SOUND ENERGY**

**PREFILED REBUTTAL TESTIMONY (NONCONFIDENTIAL) OF  
RONALD J. AMEN**

**CONTENTS**

I. INTRODUCTION .....1

II. RESPONSE TO CONCERNS ABOUT ATTRITION AND THE USED  
AND USEFUL STANDARD.....1

III. THE NEED FOR AN ATTRITION ADJUSTMENT .....6

IV. RESPONSE TO CRITIQUES OF PSE’S ATTRITION ANALYSIS.....9

V. CONCLUSION.....24

**PUGET SOUND ENERGY**

**PREFILED REBUTTAL TESTIMONY (NONCONFIDENTIAL) OF  
RONALD J. AMEN**

**LIST OF EXHIBITS**

- Exhibit RJA-7 Exponential Growth in Rate Base
- Exhibit RJA-8 Electric Attrition
- Exhibit RJA-9 Gas Attrition
- Exhibit RJA-10 Response to WUTC Staff Data Request No. 006

1 **PUGET SOUND ENERGY**

2 **PREFILED REBUTTAL TESTIMONY (NONCONFIDENTIAL) OF**  
3 **RONALD J. AMEN**

4 **I. INTRODUCTION**

5 **Q. Are you the same Ronald J. Amen who submitted prefiled direct testimony**  
6 **on June 20, 2019, on behalf of Puget Sound Energy (“PSE”) in this**  
7 **proceeding?**

8 **A. Yes.**

9 **Q. What is the purpose of your rebuttal testimony?**

10 **A. My rebuttal testimony will respond to comments by Washington Utilities and**  
11 **Transportation Commission (“WUTC” or “Commission”) witnesses Chris**  
12 **McGuire and Jing Liu regarding the “used and useful” policy issue with PSE’s**  
13 **proposed attrition adjustment. I will also address the comments of Public Counsel**  
14 **witness Mark E. Garrett concerning the prevalence of and adherence to historical**  
15 **test years by utility commissions. Finally, I will respond to more technical**  
16 **aspects of the attrition analysis performed by WUTC Staff witness Liu.**

17 **II. RESPONSE TO CONCERNS ABOUT ATTRITION AND**  
18 **THE USED AND USEFUL STANDARD**

19 **Q. What is the nature of the used and useful policy issue discussed by WUTC**  
20 **Staff witness McGuire?**

1 A. Mr. McGuire discusses PSE's reference to the recent legislative revisions to the  
2 used and useful provisions of the property valuation statute, RCW 80.04.250, as  
3 justification for not using projections of costs and rate base. Witness McGuire  
4 then points to the Commission's initiation of Docket U-190531 to consider how it  
5 will identify and review property that becomes used and useful during the rate-  
6 effective period, as support for his assertion that since "the Commission has yet to  
7 provide rules or a policy statement on this matter, PSE's portrayal of what the  
8 revised statute means for PSE's request for an attrition allowance is premature."<sup>1</sup>

9 **Q. Do you agree with Mr. McGuire's conclusion that an attrition adjustment is**  
10 **premature at this time?**

11 A. No. The recent change to the property valuation statute, RCW 80.04.250, noted  
12 by Mr. McGuire, gives the Commission the authority to set rates based on  
13 projections of plant that will be used and useful during the rate effective period.

14 The Commission has the power upon complaint or upon its own  
15 motion to ascertain and determine the fair value for rate making  
16 purposes of the property of any public service company *used and*  
17 *useful* for service in this state by or during the rate effective  
18 period...<sup>2</sup>

19 PSE's attrition adjustment is consistent with the revisions made to RCW  
20 80.04.250.

---

<sup>1</sup> McGuire, Exh. CRM-1T at 28:12-8.

<sup>2</sup> RCW 80.04.250(2).

1 **Q. Mr. McGuire suggests that despite the current lack of “rules or a policy**  
2 **statement on this matter” the Commission could still find justification for**  
3 **providing PSE with an attrition allowance in this case. What is his stated**  
4 **basis for this viewpoint?**

5 A. Mr. McGuire states, “It is possible that a properly performed attrition study could  
6 supply convincing evidence that the modified historical test year approach produces  
7 revenues insufficient to cover costs in any given rate year.”<sup>3</sup>

8 **Q. Does PSE’s attrition study provide the convincing evidence that the results of**  
9 **the modified historical test year in this case produces insufficient revenues to**  
10 **cover PSE’s costs in the rate year?**

11 A. Yes, I believe it does. Contrary to Mr. McGuire’s contention that PSE’s attrition  
12 study’s use of exponential growth curves, which assumes that the growth in  
13 expenses and rate base will *accelerate* between the test year and the rate year,  
14 results in overstated earnings attrition in the rate year,<sup>4</sup> the analysis presented later  
15 in my rebuttal testimony demonstrates that rate base growth is exponential and is  
16 validated by electric and gas utility investment data, authoritative utility industry  
17 cost indexes, and PSE’s own capital budget information.

18 **Q. Has Commission Staff expressed reservations about PSE’s attrition study as**  
19 **it relates to Staff’s view of the traditional “used and useful” principles?**

---

<sup>3</sup> McGuire, Exh. CRM-1T at 29:5-8.

<sup>4</sup> *Id.* at 29:12-15.

1 A. Yes. Ms. Liu states, “Staff believes the pro forma case more accurately reflects the  
2 verifiable revenue, expense and rate base in the modified historical test year. The  
3 attrition study relies on forecasted rate base associated with Advanced Metering  
4 Infrastructure (“AMI”) and Get-to-Zero (“GTZ”) as well as statistical trending of  
5 gross plant and expenses, creating challenges for Staff to adhere to our long-held  
6 “used and useful” and “known and measurable” principles.”<sup>5</sup>

7 **Q. Can you provide insight on the traditional application of the “used and  
8 useful” standard based on your own industry experience and research?**

9 A. Yes. In recent years, several technology and market innovations have changed  
10 the utility landscape. Like PSE, utilities are making increasing investments in  
11 assets with shorter useful lives compared to traditional utility assets. Examples of  
12 these are software, distribution automation (“DA”) and AMI. Increasing adoption  
13 of distributed energy resources (“DER”) and energy efficiency have also led to a  
14 utility industry environment of decreasing levels of sales. However, the regulatory  
15 lag built into traditional ratemaking makes it difficult for utilities to respond to  
16 these challenges expeditiously and efficiently without experiencing increasing  
17 levels of earnings attrition. The traditional interpretation of the “used and useful”  
18 standard, initially adopted to value utility property for ratemaking purposes, may  
19 exacerbate regulatory lag. As mentioned in my prefiled direct testimony, utilities  
20 across the country are progressively exploring future test years, multi-year rate

---

<sup>5</sup> Liu, Exh. JL-1CTr at 58:1-6.

1 plans, formula rate plans, Construction Work in Progress (“CWIP”) and capital  
2 expenditure trackers as a way of reducing regulatory lag.<sup>6</sup> With increasing use of  
3 more forward looking ratemaking, the traditional “used and useful” standard, and  
4 the manner in which prudence for new plant is reviewed, requires reexamination.  
5 This then becomes a question of *when* the used and useful standard is to be  
6 applied – at the time of a rate case hearing or when the plant actually becomes  
7 “used and useful.”

8 **Q. How have state utility commissions in other jurisdictions addressed the**  
9 **determination of “used and useful” plant put in service after the start of the**  
10 **rate year?**

11 A. Some jurisdictions have separated the “used and useful” review process into two  
12 steps. The first step focuses on whether the decision to incur certain costs satisfies  
13 the Commission’s prudence standard, given information known at the time the  
14 decision was made. This process can be carried out during the rate case process.  
15 The second step simply focuses on whether a particular project was managed  
16 responsibly, and the costs are reasonably in line with the estimate that led to the  
17 initial decision to incur the costs. The prudence of the investment decision is not  
18 revisited at this time. This second step can happen any time before or during the  
19 rate year. The actual rates may be trued up at this time. For example, under the  
20 Arkansas Formula Rate Plan (FRP), the utility files an Evaluation Report

---

<sup>6</sup> Amen, Exh. RJA-1T at 3:18 – page 5, 6.



1 annually. The capital investments are first proposed in this report. At that time,  
2 the prudence review of the decision to make an investment is determined. Review  
3 at the time of rate true-up is limited to cost level and related cost management  
4 factors. This approach is similar to the one I suggested in my prefiled direct  
5 testimony.<sup>7</sup>

6 **III. THE NEED FOR AN ATTRITION ADJUSTMENT**

7 **Q. Public Counsel witness Mark Garrett states that he has not found cost**  
8 **escalations similar to those presented by PSE, which provide support for**  
9 **PSE's attrition adjustment, to be the norm in other jurisdictions across the**  
10 **country.<sup>8</sup> Do you concur?**

11 A. No. Starting in 2007, the growth of electric utility plant has significantly  
12 outpaced sales, which have been stagnant. This same phenomenon has been  
13 present, and even more dramatic, for gas utility plant over the last twenty years, as  
14 energy efficiency improvements in gas end-use equipment and energy  
15 conservation measures have resulted in a lower use-per-customer trend, which has  
16 largely offset customer growth. These trends, coupled with low to moderate  
17 levels of inflation, causes an attritionary environment, as illustrated in Figures 1  
18 and 2, below.

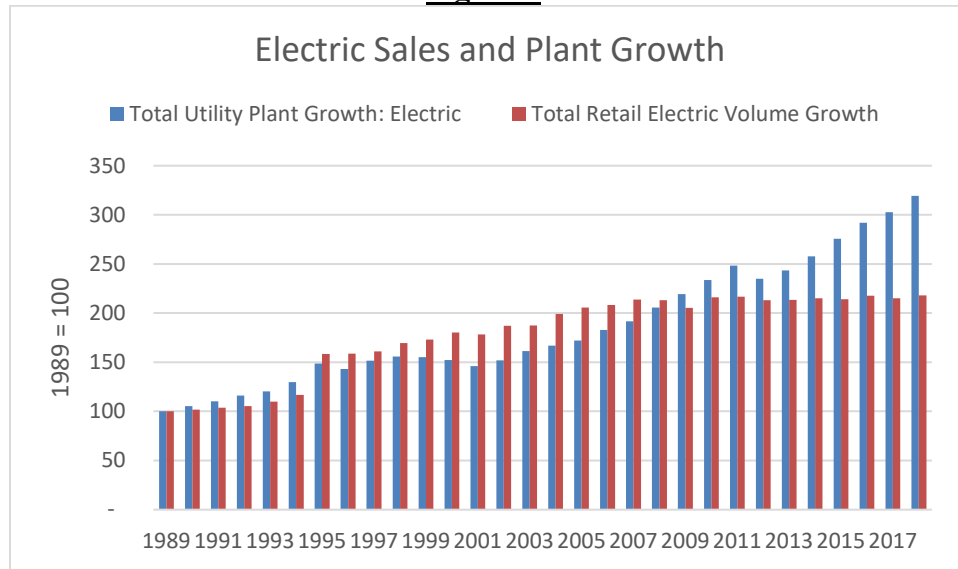
---

<sup>7</sup> Amen, Exh. RJA-1T at 22:6-12.

<sup>8</sup> Garrett, Exh. MEG-1T at 9:6-8.

1

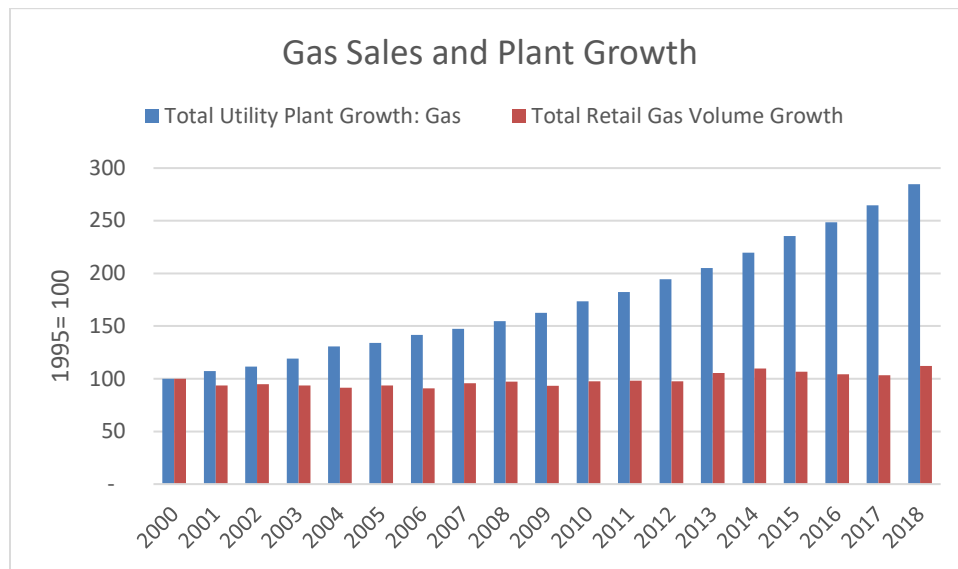
**Figure 1<sup>9</sup>**



2

3

**Figure 2<sup>10</sup>**



4

5

Additionally, as mentioned earlier, utilities have been making increasing

6

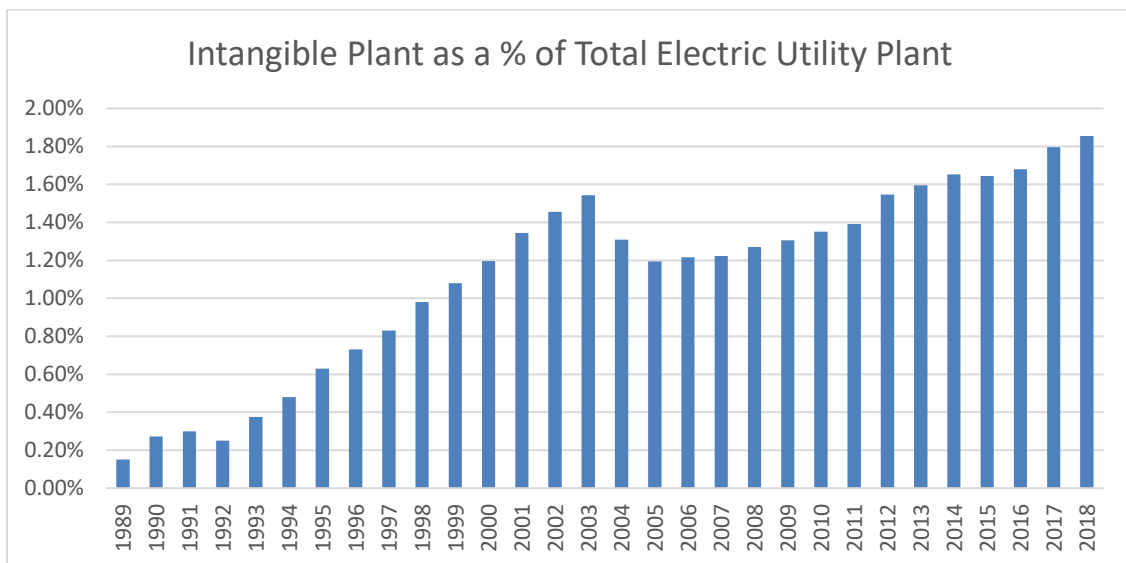
investments in assets with relatively short depreciable lives compared to

<sup>9</sup> Source: S&P Global.

<sup>10</sup> Source: S&P Global.

1 traditional utility assets. These include AMI, DA, and various Information  
2 Technology (IT) investments. Figure 3 below shows a twelve-times increase in  
3 intangible plant as a share of total electric utility plant over thirty years. While  
4 intangible plant investments for gas utilities since 2000 have grown over eight-  
5 times the levels from the last half of the prior decade, it has since leveled out over  
6 the last twenty years and been significantly outpaced by the scope of widespread  
7 gas distribution infrastructure replacement programs. Therefore, intangible gas  
8 plant as a percentage of total gas plant has since declined, as shown in Figure 4,  
9 below. At times, intangible investments may have already lost a significant share  
10 of book value by the time they are placed in rate base for ratemaking purposes.

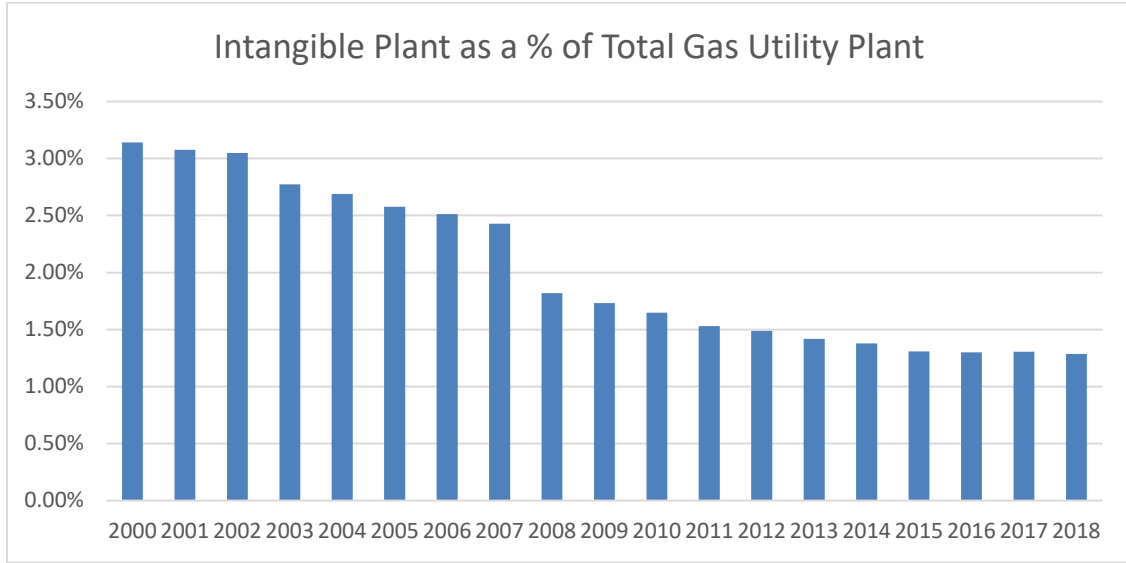
11 **Figure 3<sup>11</sup>**



12 <sup>11</sup> Source: S&P Global.

1

**Figure 4<sup>12</sup>**



2

**IV. RESPONSE TO CRITIQUES OF PSE’S ATTRITION ANALYSIS**

3

4

5

**Q. Before responding to other parties’ critiques of the attrition analysis, please summarize the methodology you employed in conducting the attrition analysis presented in your direct testimony.**

6

7

8

**A.** As discussed in my direct testimony, PSE’s latest eleven (2008 through 2018)

9

Commission Basis Reports (“CBR”) were used as the starting point for the

10

attrition analysis. The CBR data was adjusted to remove Colstrip depreciation

11

expense, PSE’s natural gas cost recovery mechanism (“CRM”), AMI, and GTZ

12

projects. The adjusted data were run through a series of regression analyses to

13

calculate growth factors for other operating revenues, operations and maintenance

<sup>12</sup> Source: S&P Global.

1 (“O&M”) expenses and plant line items. These growth factors were applied to the  
2 attrition base amounts to determine rate-year other operating revenues and O&M  
3 expenses. The growth factors for plant were used as inputs in the model  
4 developed by PSE witness Mr. Matthew R. Marcellia. Mr. Marcellia’s model  
5 projects the major components of rate year rate base, depreciation and taxes while  
6 adhering to the consistency provisions of the IRS normalization rules. I also  
7 imported PSE’s rate-year capital projections for AMI and GTZ. The rate year  
8 projections were then run through the PSE’s depreciation and tax model to  
9 determine rate year depreciation and amortization expense, accumulated  
10 depreciation and deferred federal income tax (“DFIT”).

11 For CRM, because these amounts are recovered in a separate mechanism, I  
12 removed CRM amounts from the historical data used for developing the growth  
13 factors as well as from the test year amounts that were being escalated. In the  
14 ending attrition results, I used the rate year amounts presented by PSE witness  
15 Ms. Susan E. Free in adjustment SEF-8GP. This treatment has the effect of  
16 properly not including any impacts in the attrition analysis for CRM investments,  
17 which are recovered in a separate mechanism.

18 Through the attrition analysis, I determined the revenue required at projected rate  
19 base and expenses. This amount is then compared to the revenue required under  
20 the traditional modified historical test year approach as presented by Ms. Free.

21 The resulting difference is the amount of the attrition. Separate electric and gas

1 attrition amounts were calculated to support PSE's requested increases in electric  
2 and gas rates.<sup>13</sup>

3 **Q. Did you update your attrition analysis based on PSE's position on rebuttal?**

4 A. Yes, the changes I made are discussed below.

5 **Q. What rate of return did you use in the preparation of your rebuttal exhibits?**

6 A. As summarized by Ms. Free, in anticipation of receiving the final ROE  
7 recommendation from Dr. Morin, PSE utilized 9.7 percent ROE in the preparation  
8 of its exhibits while awaiting the final determination. However, Dr. Morin's final  
9 determination of 9.5 percent ROE was received too late to incorporate into PSE's  
10 rebuttal exhibits. Consequently, the exhibits presented in this rebuttal filing are  
11 based on an ROE of 9.7 percent. In testimony, I generally state amounts at 9.7  
12 percent as that is what agrees with the corresponding exhibits presented. Where  
13 possible and relevant, I also state in testimony what the amount would be at 9.5  
14 percent ROE.

15 **Q. You mentioned above that you utilized the Company's rate-year capital**  
16 **projections for AMI and GTZ. PSE witnesses Mr. Kensok, Mr. Jacobs and**  
17 **Ms. Koch discuss utilizing updated forecast information in their rebuttal**  
18 **testimonies. Did you update the rate year capital projections for AMI and**  
19 **GTZ in your attrition analysis?**

---

<sup>13</sup>Amen, Exh. RJA-1T at 25-27.

1 A. No. The updated forecasts for AMI and GTZ were both higher than the original  
2 forecasts used in the attrition analyses that I filed on June 20, 2019 in Exhs. RJA-  
3 3 and RJA-4. Because PSE did not request the full attrition adjustments in its  
4 original or rebuttal filings,<sup>14</sup> it was not necessary to update to the new forecasted  
5 information as it would not have impacted the end result of the net revenue  
6 change PSE is requesting. Although, when calculated at 9.5 percent ROE, PSE  
7 does end up requesting its full attrition adjustment for electric, the amount it is  
8 under the 6.9 percent revenue increase established in Exh. JAP-14 in PSE's direct  
9 filing is immaterial. See Table 1 in Ms. Free's rebuttal testimony.

10 **Q. Please describe the changes to your attrition results that are presented in**  
11 **your rebuttal testimony.**

12 A. In the original filing, the electric attrition revenue deficiency, which is comprised  
13 of the fixed production, transmission, and delivery attrition evaluation, supports  
14 an increase to electric base rates, exclusive of power costs, of \$118.4 million.  
15 PSE's gas attrition revenue deficiency, consisting of the fixed production and  
16 delivery attrition evaluation, supported an increase to gas base rates of \$108.2  
17 million.

18 I have presented revised attrition results of \$90.7 million for electric and \$112.4  
19 million for gas. These results are included in Exh. RJA-8 for electric and Exh.  
20 RJA-9 for gas. When calculated at 9.5 percent ROE, the attrition results are \$84.2

---

<sup>14</sup> See, line 23 on page 1 of Exhs. SEF-3E, SEF-3G, SEF-18E and SEF-18G.

1 million for electric and \$109.7 million for gas.<sup>15</sup>

2 **Q. Please explain the differences between the attrition results in the original and**  
3 **rebuttal filings.**

4 A. Subsequent to the original filing, several necessary corrections to the attrition  
5 revenue requirement calculations were identified. PSE provided these corrections  
6 in its First Revised Response to AWEC Data Request No. 020 which Ms. Liu  
7 attached to her testimony as Exh. JL-22. The impact on the attrition deficiency  
8 was a decrease to electric of \$0.9 million and an increase to gas of \$8.2 million.  
9 There were other corrections and updates identified after the submittal of the First  
10 Revised Response to AWEC Data Request No. 020. I have identified the witness  
11 in whose exhibits the change is discussed. These changes are detailed below:

- 12 1. Ms. Liu identified that PSE inadvertently did not remove the Production  
13 O&M for Colstrip Units 1 and 2 from its attrition calculation.<sup>16</sup> Therefore,  
14 I have removed this amount on page 1 of Exh. RJA-8.
- 15 2. I identified a needed correction to the growth factors used for electric  
16 transmission and distribution plant categories. The factors used in Exh.  
17 RJA-3 were linear when I had intended for them to be logarithmic. This  
18 change updates the factors from 5.32% to 5.77% for electric transmission  
19 plant and from 3.44% to 3.09% for electric distribution plant.
- 20 3. Ms. Liu identified that the Other Operating Expense should not have a  
21 growth factor applied because this cost category contains regulatory  
22 amortizations that do not exhibit a consistent trend.<sup>17</sup> Additionally,  
23 amortizations are known amounts for the rate year. Therefore, PSE agrees  
24 with this assessment. I have made this change in Exhs. RJA-8 and RJA-9.

---

<sup>15</sup> Exhibits RJA-8 and RJA-9 reflect an underlying ROE of 9.7%. Two sets of work papers will be submitted – one set reflecting a 9.7% ROE and one set reflecting a 9.5% ROE.

<sup>16</sup> Liu, Exh. JL-1CT at 70:21-23.

<sup>17</sup> *Id.* at 71:18-23



- 1 4. Mr. Matthew R. Marcellia in his Prefiled Rebuttal Testimony, Exh. MRM-  
 2 11T, discussed that the way in which accumulated depreciation and  
 3 accumulated deferred income taxes for PSE’s CRM were treated in the  
 4 attrition model requires correction. I have made this correction.
- 5 5. In his Prefiled Rebuttal Testimony, Exh. MDM-7T, PSE witness Matthew  
 6 D. McArthur provides the rate of return of 7.57 percent that is based on  
 7 the revised return on equity of 9.7 percent used by PSE in preparation of  
 8 its exhibits as well as the requested rate of return of 7.48 percent that is  
 9 based on the recommended return on equity of 9.5 percent supported by  
 10 PSE witness Dr. Roger A. Morin. I have incorporated this updated rate of  
 11 return in the calculation of the attrition deficiencies.

12 The table below provides a summary of the changes and their impacts at 9.7  
 13 percent and 9.5 percent ROE:

14 **Table 1 – Summary of Changes to PSE’s Attrition Revenue Requirement**

Line	Description	At 9.7% ROE			At 9.5% ROE		
		Electric	Gas	Combined	Electric	Gas	Combined
1	Attrition revenue requirement filed June 20, 2019	\$ 118.4	\$ 108.2	\$ 226.6	\$ 118.4	\$ 108.2	\$ 226.6
2	Impacts of First Revised Response to AWEC 20	(1.0)	8.2	7.2	(1.0)	8.2	7.2
3	Remove Colstrip 1 and 2 Production O&M	(20.6)		(20.6)	(20.6)		(20.6)
4	Correction of electric transm and dist growth factors	(1.8)		(1.8)	(1.8)		(1.8)
5	Use 0% growth rate for Other Operating Expenses	(0.8)	(0.5)	(1.3)	(0.8)	(0.5)	(1.3)
6	Corrections to ADIT in MRM		(2.1)	(2.1)		(2.1)	(2.1)
7	Update rate of return	(3.6)	(1.4)	(5.0)	(10.1)	(4.0)	(14.1)
8	Other	0.0	0.0	0.0	0.0	-	0.0
9	Subtotal Changes	(27.7)	4.2	(23.5)	(34.2)	1.5	(32.8)
10	Attrition revenue requirement filed January 15, 2020	\$ 90.7	\$ 112.4	\$ 203.1	\$ 84.2	\$ 109.7	\$ 193.8

15

16 **Q. What were the results of WUTC Staff witness Jing Liu’s attrition analysis?**

17 A. Ms. Liu’s attrition analysis resulted in a rate year revenue *sufficiency* of \$2.5 million  
 18 for electric operations and a rate year revenue deficiency of \$12.1 million for natural  
 19 gas operations.<sup>18</sup>

<sup>18</sup> *Id.* at 57.

1 **Q. In Exhibit JL-1CTr at page 58 lines 13-15, Ms. Liu indicates the Commission**  
2 **shouldn't authorize an attrition adjustment because PSE included two large**  
3 **capital projects in its regression models that should have been excluded. Do**  
4 **you agree with Ms. Liu's assessment?**

5 A. No. Ms. Liu is referring to the LNG distribution upgrades and the software  
6 related to PSE's participation in the Energy Imbalance Market ("EIM"). As  
7 discussed by Ms. Free, PSE does not agree that these costs should be removed  
8 from the attrition analysis. Ms. Liu's testimony reads as if she believes their  
9 inclusion is a basis for the Commission to not approve an attrition adjustment for  
10 PSE. I would agree that whether or not to include these items in the attrition  
11 adjustment is a difference of opinion between PSE and Commission Staff, but I  
12 do not believe that it rises to the level of a reason that the Commission should not  
13 grant an attrition adjustment.

14 **Q. Ms. Liu filed revisions to her testimony on December 17, 2019. Have you**  
15 **reviewed her changes, and do you agree with them?**

16 A. Yes, I reviewed them. There is one change that she made with which I do not  
17 agree. Ms. Liu changed the number of years of data used in her electric intangible  
18 model from 7 years to 11 years. She did not provide any justification for this  
19 change.

20 **Q. Can you summarize Ms. Liu's opinion on the application of exponential**  
21 **growth for rate base?**

1 A. Yes, Ms. Liu states that PSE's decision making related to plant additions does not  
2 follow compound growth rationale. She quotes PSE's capital budget to state that  
3 overall capital expenditures will peak in 2020 and decline thereafter.

4 **Q. Do you agree with Ms. Liu's assessment?**

5 A. No. I will demonstrate that rate base growth is exponential even if plant additions  
6 are not experiencing exponential growth. In plant accounting, gross plant balance  
7 is calculated as:

- 8 1. Gross plant balance beginning of the period,
- 9 2. Less: Retirements
- 10 3. Plus: Replacements
- 11 4. Plus: Additions

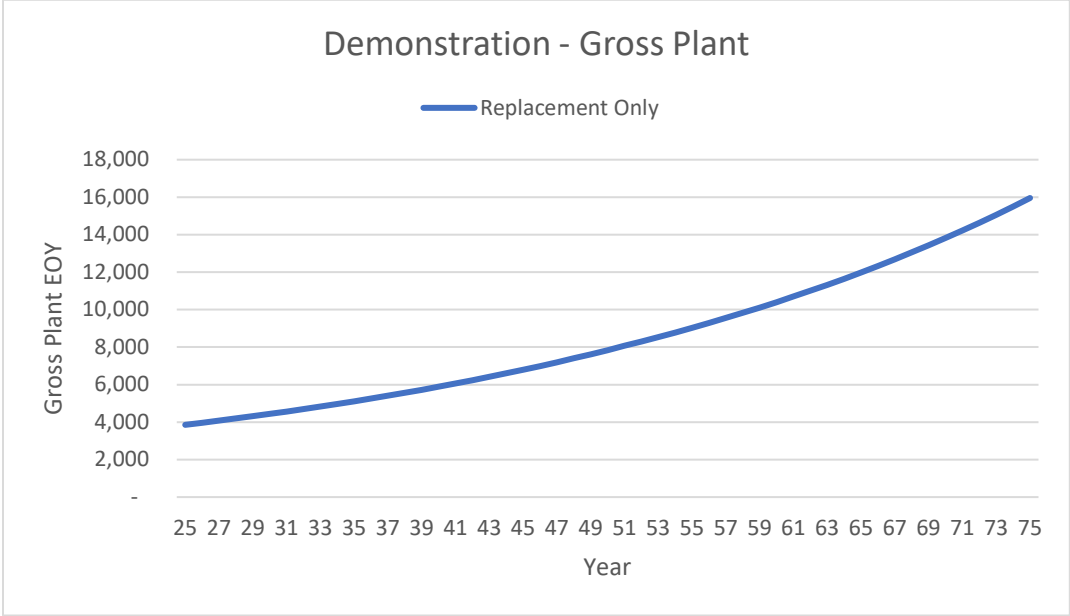
12 In Figure 5, I have shown capital asset stock with 25 years of depreciation life,  
13 built with a real equivalent of \$100 capital investment each year. In year 26, the  
14 initial \$100 investment would have to be retired and replaced. However due to  
15 inflation, the same asset that cost \$100 in year 1 costs \$209<sup>19</sup> in year 26. So, the  
16 gross plant balance experiences a \$109 growth even without a single dollar of  
17 capital addition. Continuing this trend, one can clearly see an exponential plant  
18 balance. In fact, the only configuration in which a utility can have a non-  
19 exponential plant growth is when it is not growing and only partially replacing its

---

<sup>19</sup> A 3% inflation assumption was used for this demonstration.

1 existing asset base. This is a highly unlikely scenario for PSE. The detailed  
2 calculations can be found in Exh. RJA-7.

3 **Figure 5**



4  
5 **Q. Can you present some empirical evidence to support exponential growth?**

6 A. Yes. Table 2 below shows gross plant investment across all major U.S. electric  
7 utilities over the period of 1988 to 2018. I have also inserted a linear trend-line in  
8 Figure 6 to contrast with plant. The trend can be clearly seen and mathematically  
9 proven to be an exponential fit.

10 **Table 2<sup>20</sup>**

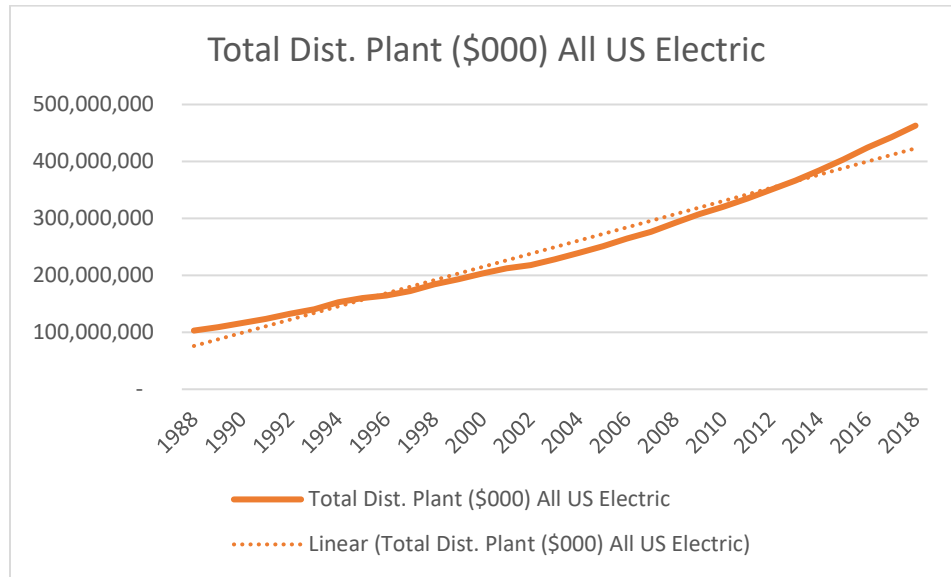
Year	Total Dist. Plant (\$000) All US Electric
1988	103,012,745
1989	108,984,957

<sup>20</sup> Source: S&P Global

1990	116,506,258
1991	123,760,515
1992	132,763,070
1993	140,288,591
1994	152,923,049
1995	159,910,515
1996	164,555,193
1997	172,238,258
1998	184,136,285
1999	193,066,010
2000	203,385,548
2001	212,235,532
2002	218,039,280
2003	228,065,096
2004	239,163,278
2005	250,934,642
2006	264,789,299
2007	276,197,560
2008	292,221,464
2009	307,210,906
2010	320,336,882
2011	335,043,951
2012	350,704,701
2013	366,437,138
2014	384,243,706
2015	403,179,783
2016	423,970,137
2017	442,854,197
2018	462,914,657

1

**Figure 6**



2

3 **Q. Can you provide statistical evidence that supports exponential trend?**

4 A. Yes. Ms. Liu provided a series of charts to support her assertion that growth is not  
 5 exponential. These charts showing a limited timeframe can create an impression  
 6 that growth is linear. However, this does not withstand statistical scrutiny. Table 3  
 7 shows a statistical comparison of Staff attrition model and PSE’s model. In all  
 8 plant categories, PSE’s exponential model performs similar or better than Staff’s  
 9 linear model. This holds true both in terms of overall model fit (R-square) and  
 10 variable predictability (p-value).

1

**Table 3**

	Staff Model				PSE Model				Better Fit	Variable Confidence
	Observed Years	Growth rate	R Square	p-value	Observed Years	Growth rate	R Square	p-value	R Square	p-value
<b>Electric Plant</b>										
Production	6	0.14%	16.6%	0.4965	6	1.50%	84.0%	0.0101	PSE	PSE
Transmission	7	4.60%	98.6%	0.0000	7	5.77%	99.3%	0.0000	PSE	Similar
Distribution	7	3.08%	96.8%	0.0001	7	3.09%	98.3%	0.0000	PSE	Similar
Intangible	11	5.90%	87.9%	0.0000	7	16.16%	93.4%	0.0004	PSE	Similar
General	9	4.43%	90.7%	0.0001	9	6.04%	97.5%	0.0000	PSE	Similar
<b>Gas Plant</b>										
Production	5	1.45%	93.5%	0.0072	5	1.33%	96.5%	0.0029	PSE	PSE
Transmission										
Distribution	10	3.68%	99.8%	0.0000	11	5.22%	99.7%	0.0000	Similar	Similar
Intangible	8	8.34%	84.8%	0.0006	8	15.11%	96.4%	0.0000	PSE	Similar
General	10	2.14%	53.0%	0.0170	11	2.90%	86.7%	0.0000	PSE	PSE

2

3

**Q. Have you validated your exponential attrition model against any relevant utility industry indices?**

4

5

A. Yes. The Handy-Whitman Indexes are a well-established, authoritative set of industry indexes that are routinely applied in the utility industry. The Handy-Whitman Index calculates the cost trends for different types of utility construction. Separate indexes are published for the electric, gas and water industries. These indexes are used by regulatory bodies, operating utilities, service companies, and valuation engineers, as well as insurance companies. Figures 7, 8 and 9 below demonstrate exponential nature of electric transmission, electric distribution and gas total plant costs. Each of these categories demonstrate a better exponential fit than linear.

6

7

8

9

10

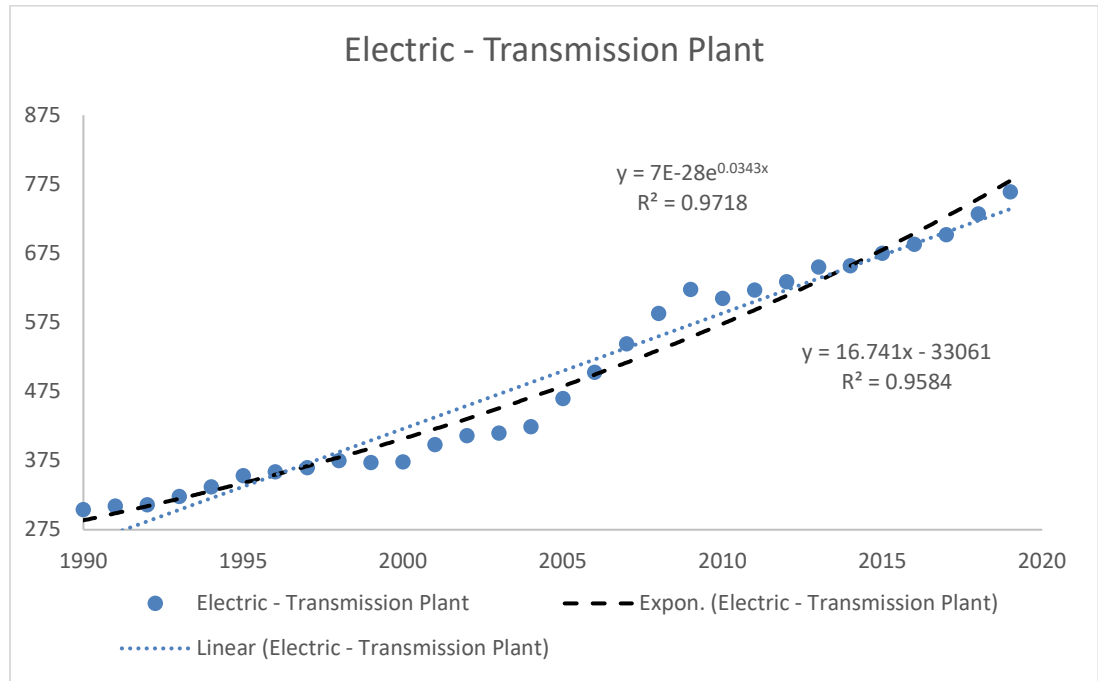
11

12

13

1

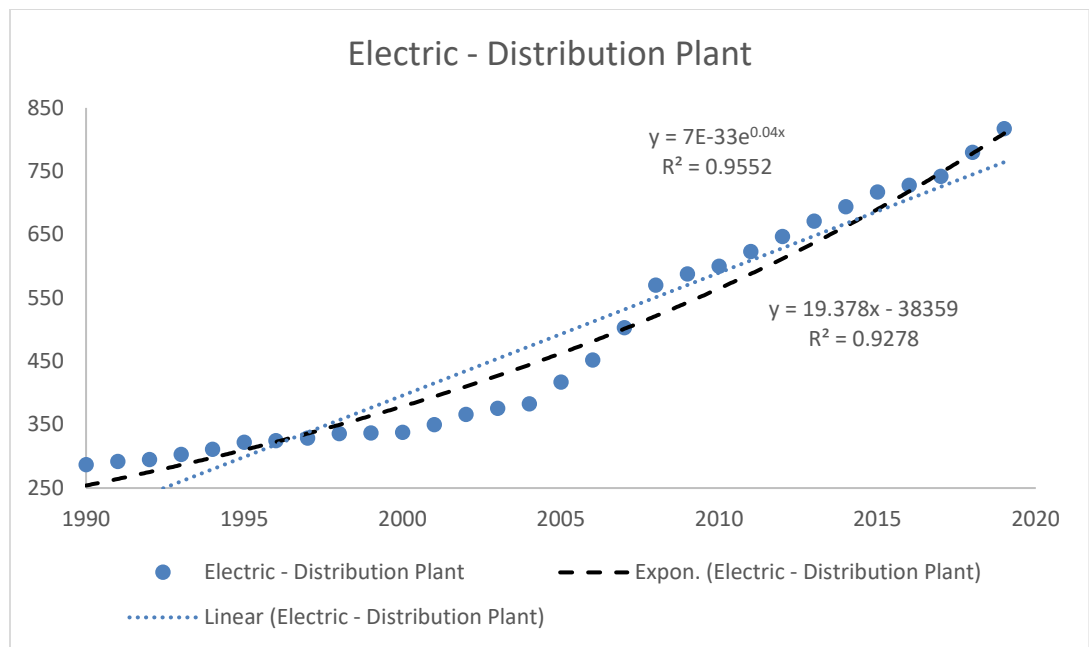
**Figure 7**



2

3

**Figure 8**

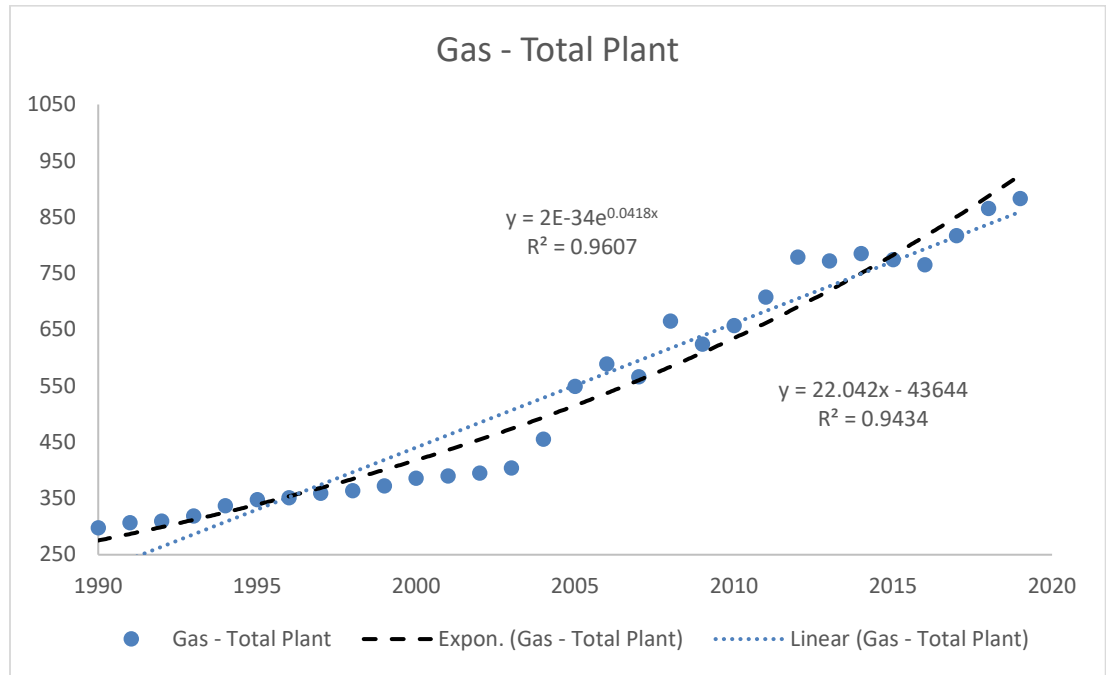


4



1

**Figure 9**



2

3

**Q. Do you agree with Ms. Liu that using an exponential model overstates PSE’s electric and gas plant growth?**

4

5

A. No. PSE witness Josh Kensok provides budget information that serves both to validate my attrition projections and the reliability of PSE’s budgets.

6

7

**Q. Do you agree with Ms. Liu that combining growth trends such as transmission and distribution expenses skews the results?**

8

9

A. No, this assertion has no mathematical basis. The transmission and distribution expenses were combined in my PSE analysis to reflect the fact that PSE had a reclassification of some expenses in 2011-2012 timeframe. As shown in Figure 10, this caused a step increase in transmission expenses in 2012 and a corresponding step decrease in distribution expenses. Witness Liu ignored this

10

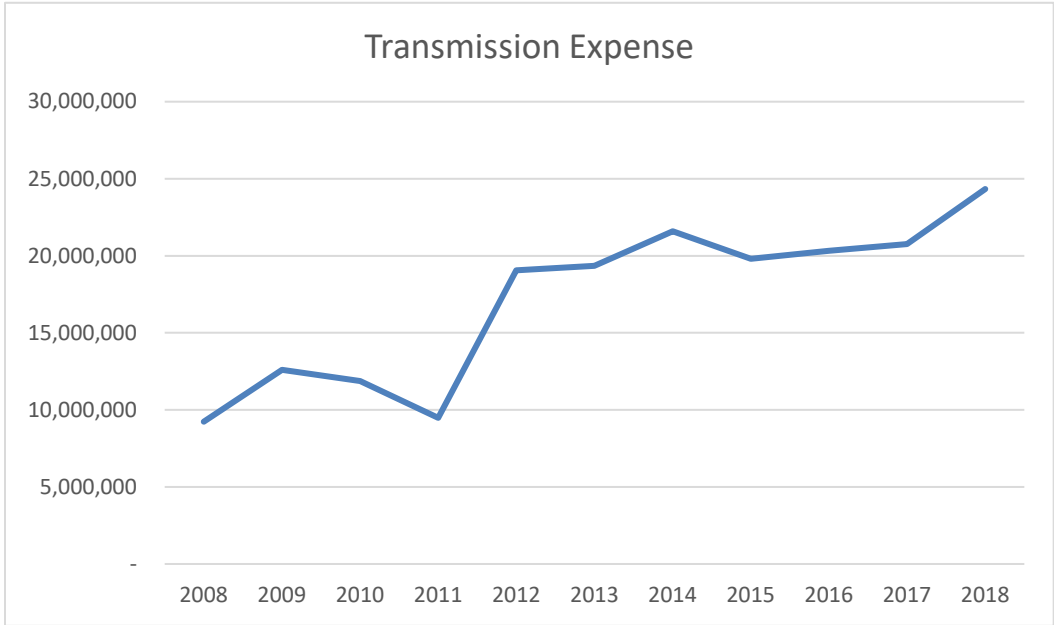
11

12

13

1 fact, and as a result, obtained poor regression results and settled on using a CAGR  
2 that understates the growth.

3 **Figure 10**



4  
5 **Q. What about Ms. Liu’s changes to customer accounts and customer service**  
6 **expenses?**

7 A. Again, there is no mathematical basis to this assertion. In any case, the resulting  
8 changes are relatively small and cancel each other out on electric and gas side, as  
9 shown in Table 4.

10 **Table 4**

<b>ELECTRIC</b>	<b>Customer Account Expenses</b>	<b>Customer Service Expenses</b>	<b>Total Customer Expenses</b>
Growth Rate	2.40%	6.56%	2.45%
Escalation Base	28,149,920	1,763,236	29,913,156
Projection	29,754,201	2,044,949	31,652,504
Difference			(146,647)

<b>GAS</b>			
Growth Rate	0.78%	2.32%	1.09%
Escalation Base	28,149,920	1,763,236	29,913,156
Projection	28,664,915	1,860,166	30,681,956
Difference			156,874

1 **Q. Do you agree with Ms. Liu that other operating expenses do not exhibit**  
2 **consistent trend and therefore should not be trended?**

3 A. Yes.

4 **Q. Have you made any other corrections or changes to the attrition analysis?**

5 A. Yes. I have changed references in workpaper 190529-30-PSE-WP-RJA-8-  
6 Attrition-Study-19GRC-01-2020.xlsx to the electric transmission and distribution  
7 plant growth rates to connect to the exponential regression growth rates. The  
8 previous references were incorrect. I have also made the correction to AMI  
9 accumulated deferred income taxes, as described in Exhibit RJA-10, the response  
10 to WUTC Staff Data Request No. 006. The reference error has no impact on the  
11 revenue deficiency.

12 **V. CONCLUSION**

13 **Q. What should the Commission conclude related to PSE's attrition**  
14 **adjustment?**

15 A. PSE's attrition study provides convincing evidence that the results of the modified  
16 historical test year proposed by the Commission Staff in this case produces  
17 insufficient revenues to cover PSE's costs in the rate year. PSE's attrition study's  
18 use of exponential growth curves, which reflects the growth in expenses and rate

1 base that will accelerate between the test year and the rate year, demonstrates that  
2 rate base growth is exponential and is validated by electric and gas utility  
3 investment data, authoritative utility industry cost indexes, and PSE's own capital  
4 budget information. PSE's attrition adjustment proposal is reasonable as an  
5 acceptable method of mitigating the adverse impacts of regulatory lag and the  
6 earnings attrition that it causes following the rate effective date in this case and  
7 should be approved by the Commission.

8 **Q. Does this conclude your prefiled rebuttal testimony?**

9 A. Yes.