



**Portland General Electric Company**  
121 SW Salmon Street • 1WTC0306 • Portland, OR 97204  
portlandgeneral.com

September 29, 2021

*Via Electronic Filing*

Public Utility Commission of Oregon  
Attention: Filing Center  
201 High Street Southeast, Suite 100  
Post Office Box 1088  
Salem, Oregon 97308-1088

Re: **UM 2152 – In the Matter of Portland General Electric Company, Detailed  
Depreciation Study of Electric Utility Properties**

Dear Filing Center:

On behalf of Portland General Electric Company, Staff of the Public Utility Commission of Oregon and the Oregon Citizens' Utility Board, enclosed for electronic filing today in the above-captioned docket is the Stipulating Parties Reply Testimony.

Thank you for your assistance. If you have any questions, please do not hesitate to call me.

Sincerely,

A handwritten signature in black ink that reads "Jaki Ferchland". The signature is written in a cursive, flowing style.

Jaki Ferchland  
Manager, Revenue Requirement

JF:dm  
Enclosures

**BEFORE THE PUBLIC UTILITY COMMISSION  
OF THE STATE OF OREGON**

**UM 2152**

**Stipulating Parties Testimony in Response to AWEC's  
Objection to the Stipulation**

---

**Reply Testimony of**

***Ming Peng, OPUC***

***Will Gehrke, CUB***

***John Spanos, On behalf of PGE***

**September 29, 2021**

**TABLE OF CONTENTS**

|  |    |
|--|----|
| I. INTRODUCTION AND PURPOSE .....  | 1  |
| II. THEORETICAL RESERVE IMBALANCE .....  | 3  |
| III. SERVICE LIFE ESTIMATES.....   | 22 |
| IV. NET SALVAGE ESTIMATES .....  | 27 |
| V. MR. KAUFMAN’S CRITICISMS OF SUPPORT FOR THE STUDY AND<br>DEFICIENCIES WITH HIS PROPOSALS..... | 29 |

1                                   **I. INTRODUCTION AND PURPOSE**

2   **Q. Please state your names and positions.**

3   A. My name is Ming Peng. I am a Senior Econometrician for the Public Utility  
4       Commission of Oregon (Commission). My business address is 201 High St. SE, Suite  
5       100, Salem, Oregon, 97301.

6               My name is William Gehrke. I am an economist employed by the Citizens’  
7       Utility Board (CUB).

8               My name is John J. Spanos. I am President at Gannett Fleming Valuation and  
9       Rate Consultants, LLC. My business address is 207 Senate Avenue, Camp Hill,  
10       Pennsylvania 17011. I represent Portland General Electric Company (PGE) in this  
11       docket.

12               Collectively we represent the Stipulating Parties in Docket No. UM 2152.

13               Our qualification statements are found in Stipulating Parties Exhibits 105, 106  
14       and 107.

15   **Q. What is the purpose of your testimony?**

16   A. Our testimony responds to the testimony of Alliance of Western Energy Consumers  
17       (“AWEC”) witness Lance Kaufman on issues related to depreciation.

18   **Q. Please summarize your testimony.**

19   A. On July 29, 2021, PGE filed a Stipulation resolving issues in this case. All parties agreed  
20       to the Stipulation except AWEC. AWEC witness Lance Kaufman provides testimony

1 proposing a variety of adjustments to the depreciation rates and parameters agreed to in  
2 the Stipulation. The most notable proposal is to significantly reduce depreciation  
3 expense by over \$50 million per year through a short-term reduction in depreciation  
4 expense based on a calculated theoretical reserve imbalance or what Mr. Kaufman refers  
5 to as “excess reserves”. The result of this proposal is that once this short-term reduction  
6 concludes, customers will experience a significant increase in depreciation expense of  
7 at least \$50 million. This increase is due to both the expiration of Mr. Kaufman’s  
8 proposal and higher depreciation rates that result from a lower accumulated depreciation  
9 balance. Customers will also have to pay for a much higher rate base.

10 In addition to his proposal related to the amortization of the reserve,  
11 Mr. Kaufman has proposed adjustments to interim survivor curves for various  
12 generation accounts, survivor curve estimates for two transmission accounts, net salvage  
13 estimates for two accounts and an increase in the life span for one hydro facility. We will  
14 address each of these proposed adjustments in our testimony. However, it is important  
15 to recognize that the parties to the Stipulation have all agreed to the service lives and  
16 net salvage included in the Stipulation. Mr. Kaufman’s recommendations are largely  
17 unreasonable, based on flawed assumptions, and incomplete, as Mr. Kaufman did not  
18 calculate or propose any depreciation rates to determine the overall impact on PGE’s  
19 depreciation expense. Consequently, Mr. Kaufman has not provided adequate reason

1 and supporting analysis to deviate from the estimates agreed to by the parties to the  
2 Stipulation.

3 **II. THEORETICAL RESERVE IMBALANCE**

4 **Q. What is a theoretical reserve imbalance?**

5 A. A theoretical reserve imbalance ("TRI" or "imbalance") is calculated as the difference  
6 between a company's book accumulated depreciation, or book reserve, and the  
7 calculated accrued depreciation, or theoretical reserve. We should note that in some  
8 proceedings in this and other jurisdictions, different terms have been used for the  
9 theoretical reserve imbalance, including "theoretical reserve variance," "excess  
10 reserve," "reserve surplus" or "reserve deficit" and "theoretical excess depreciation  
11 reserve." For this testimony we will use the term "theoretical reserve imbalance," which  
12 is consistent with the terminology used in the National Association of Regulatory Utility  
13 Commissioners' ("NARUC") publication *Public Utility Depreciation Practices*.  
14 Terms such as "excess reserve," and "reserve surplus" can be misleading, since they  
15 imply that the theoretical reserve is a more precise figure than it is. These terms also  
16 suggest that accumulated depreciation represents a pool of money or funds that can be  
17 used for various financial objectives, which is not the case.

18 **Q. What is the book reserve?**

19 A. The book reserve, also referred to as the "book accumulated depreciation" or the  
20 "accumulated provision for depreciation," is a running total of historical depreciation

1 activity. It is equal to the historical depreciation accruals, less retirements and cost of  
2 removal, plus historical gross salvage. The book reserve also represents a reduction to  
3 the original cost of plant when calculating rate base.

4 **Q. What is the theoretical reserve?**

5 A. The theoretical reserve is an estimate of the accumulated depreciation based on the  
6 current plant balances and depreciation parameters (service life and net salvage  
7 estimates) at a specific point in time. It is equal to the portion of the depreciable cost of  
8 plant that will not be allocated to expense through future whole life depreciation accruals  
9 based on the current forecasts of service life and net salvage. The theoretical reserve is  
10 also referred to as the "Calculated Accrued Depreciation" or "CAD."

11 **Q. How is the theoretical reserve calculated?**

12 A. Using the average service life procedure employed for this study, the theoretical reserve  
13 is calculated for each vintage in each depreciable group using the following formula:

14 
$$\textit{Theoretical Reserve} = (\textit{Original Cost} - \textit{Net Salvage}) \times (1 - \textit{Remaining Life} / \textit{Average Service Life})$$

15 The remaining life and average service life are determined for each vintage (year  
16 of installation) based on the survivor curve estimate (life and dispersion pattern).

17 The theoretical reserve for an account is equal to the sum of the theoretical reserve  
18 amounts for each vintage.

19 **Q. Why is it called theoretical?**

1 A. The reserve is called theoretical because it is not based upon actual recorded  
2 depreciation resulting from the application of depreciation rates used by the Company  
3 and approved by the Commission. Instead, it is an estimate based on the formula  
4 described previously.

5 **Q. Why does one calculate a theoretical reserve?**

6 A. A theoretical reserve is calculated as an analytical tool or benchmark to identify how  
7 current estimates compare to the provisions using previous estimates in calculating  
8 annual depreciation. It can also be used as a basis to allocate the book reserve to  
9 accounts, subaccounts or vintages of plant. A theoretical reserve calculation provides a  
10 snapshot of the reserve, valid only at the time it is calculated, since any changes in the  
11 proposed parameters or plant and reserve activity will change the theoretical reserve.

12 **Q. Mr. Kaufman argues that the difference in the book and theoretical reserve**  
13 **represents an “excess” in the accumulated provision for depreciation. Is that**  
14 **accurate?**

15 A. No. While there is a difference between book accumulated depreciation and the  
16 theoretical depreciation reserve, this amount is not an “excess.” It is simply a theoretical  
17 calculation of the difference between the actual accumulated depreciation, based on the  
18 Company’s historical experience and Commission-approved depreciation rates, and a  
19 theoretical amount based solely on the proposed depreciation parameters. Depreciation  
20 is a prospective calculation, and thus changes as life and net salvage parameters change



1 in future studies. As the Company moves through time with varying experience, this  
2 difference can change positively or negatively.

3 There are also reasons that we might expect the theoretical reserve imbalance to  
4 decrease in the future. The electric industry in Oregon and neighboring states is going  
5 through a significant transition from fossil fuels to other energy sources. It is very  
6 possible that, as the electric system is updated to incorporate these fuel sources, assets  
7 will be replaced at a more rapid pace than has occurred historically. Further, PGE has,  
8 in recent years, made significant investments to their Transmission and Distribution  
9 systems, and its service territory continues to experience the effects of climate change  
10 and severe weather (wildfires in 2020 and a major ice storm in 2021) which result in  
11 unanticipated damages to those systems.

12 Given these circumstances, the theoretical reserve imbalance will decrease and  
13 could even become a negative amount. If Mr. Kaufman’s proposal to effectively reduce  
14 this amount to zero over the next ten years were adopted, it is very likely that the  
15 theoretical reserve imbalance would be negative in future depreciation studies.

16 **Q. Is the theoretical reserve imbalance harmful to current customers?**

17 A. No. In fact, current customers benefit from the existence of a theoretical reserve  
18 imbalance in two ways. The first is that depreciation based on the remaining life  
19 technique is lower than it otherwise would be. The second is that, because the book  
20 reserve is a reduction to the original cost of plant, rate base is lower and customers pay

1 a lower return on rate base. Current customers are not harmed from a theoretical reserve  
2 imbalance that developed over many years.

3 **Q. What is Mr. Kaufman’s proposal in this case related to the theoretical reserve**  
4 **imbalance?**

5 A. Mr. Kaufman is proposing (1) to transfer “excess” reserve from accounts in various  
6 functions to the steam production accounts to equal the future accruals expected for  
7 Colstrip and (2) to amortize the remaining portion of the theoretical reserve imbalance  
8 over a ten-year period.

9 **Q. Is Mr. Kaufman’s proposal a common practice in the industry?**

10 A. No. Most utilities, Commissions and depreciation texts agree that theoretical reserve  
11 differences frequently exist and are best resolved using the remaining life technique.  
12 The remaining life technique is the most widely accepted approach and should be used  
13 unless unique and significant circumstances otherwise warrant deviation from this  
14 practice. While Mr. Kaufman discusses at length the size of the theoretical reserve  
15 imbalance, he does not provide any unique circumstances that would require addressing  
16 the reserve imbalance more quickly than occurs from using the remaining life technique.  
17 The theoretical reserve imbalance is developed over many years and is based on  
18 estimates of the future. It, therefore, should not be resolved in a short period of time, as  
19 Mr. Kaufman proposes. It is more appropriate to allocate costs through depreciation  
20 over the remaining time the Company’s assets will be in service using the remaining life

1 technique. Mr. Kaufman’s amortization approach is a short-term subsidy for current  
2 customers that will result in increased costs for future customers.

3 Further, his proposal to transfer reserve across functions is not appropriate.  
4 While he minimizes such issues in his testimony, there are cost allocation issues and  
5 potential jurisdictional issues with transferring reserves from other functions such as  
6 transmission and distribution to generation. For this reason, the Federal Energy  
7 Regulatory Commission (“FERC”) has not typically allowed transfers of reserves across  
8 functions.

9 **Q. Has the Commission accepted the use of the remaining life technique for PGE in**  
10 **the past?**

11 A. Yes. The Company has used the remaining life technique for developing depreciation  
12 rates for many years. The remaining life technique has been accepted by the  
13 Commission for other utility companies in Oregon as well. To our knowledge,  
14 Mr. Kaufman’s approach has not been approved in Oregon.

15 **Q. Referring to authoritative sources, what does the National Association of**  
16 **Regulatory Utility Commissioners (NARUC) say regarding this issue?**

17 A. NARUC makes several comments regarding theoretical reserve imbalances in its  
18 publication *Public Utility Depreciation Practices*. On page 189, NARUC states:

19 When a depreciation reserve imbalance exists, one should investigate  
20 why past depreciation rates, average service lives, salvage, or cost of

1 removal amounts differ from the current estimates. Care should be taken  
2 to analyze these effects before correcting for the reserve imbalances.  
3 Instances occur where subsequent experience shows the original  
4 estimates no longer to be appropriate. It should be noted that only after  
5 plant has lived its entire useful life will the true depreciation parameters  
6 become known.<sup>1</sup>

7 **Q. Does NARUC provide additional guidance addressing the remaining life**  
8 **technique?**

9 A. Yes. NARUC also notes that:

10 The desirability of using the remaining life technique is that any  
11 necessary adjustments of depreciation reserves, because of changes to  
12 the estimates of life and net salvage, are accrued automatically over the  
13 remaining life of the property. Once commenced, adjustments to the  
14 depreciation reserve, outside of those inherent in the remaining life rate  
15 would require regulatory approval.<sup>2</sup>

16 Combined with the NARUC passage cited earlier urging caution, NARUC's  
17 recommendation is that for companies like PGE that use the remaining life technique,  
18 any accelerated amortization, such as proposed by Mr. Kaufman, must be based on  
19 unique circumstances that justify specific Commission approval. Despite  
20 Mr. Kaufman's claims, such circumstances do not exist for PGE, and the size of the  
21 reserve imbalance alone does not justify such treatment.

---

<sup>1</sup> *Public Utility Depreciation Practices*, NARUC, 1996, pp. 189.

<sup>2</sup> NARUC, p. 65.

1           We note that Mr. Kaufman cites this same passage in his testimony. However,  
2           he completely misinterprets the meaning of this passage, claiming that NARUC  
3           “explicitly calls out the necessity for commissions to approve depreciation reserve  
4           adjustments for utilities that rely on the Remaining Life Technique.”<sup>3</sup> This is, in fact,  
5           the exact opposite of what NARUC says, and in no way does NARUC indicate a  
6           “necessity” for reserve adjustments when the remaining life technique is used.  
7           When one reads the full passage, it is clear that NARUC means that the reserve  
8           adjustments are not necessary if the remaining life technique is used because the  
9           remaining life automatically corrects any reserve imbalances. Any explicit adjustments  
10          would be relatively rare and, as a result, would “*require* regulatory approval” (emphasis  
11          added). That Mr. Kaufman’s interpretation is incorrect is also evidenced by the fact that  
12          the vast majority of depreciation studies using the remaining life technique do not  
13          incorporate a reserve adjustment similar to what Mr. Kaufman proposes.

14   **Q.   Mr. Kaufman cites a handful of cases in which amortizations of theoretical reserve**  
15   **imbalances were adopted. Are these common?**

16   **A.**   No. Additionally, for some of the cases cited by Mr. Kaufman, subsequent depreciation  
17          studies resulted in negative theoretical reserve imbalances. That is, subsequent  
18          experience indicated that such adjustments were incorrect. For example, he cites an

---

<sup>3</sup> Kaufman at 23.

1 amortization of the reserve imbalance for PacifiCorp’s Hunter Plant approved by the  
2 Idaho Commission. However, in PacifiCorp’s more recent depreciation study this plant  
3 had a negative reserve imbalance. This illustrates the concept that reserve imbalances  
4 change over time and provides a reason why dramatic actions, such as proposed by  
5 Mr. Kaufman, are not sound policy. Additionally, PacifiCorp also files studies in  
6 Oregon and the same treatment was not adopted here as was in Idaho.

7 We note that Mr. Kaufman has only cited a handful of cases over the course of  
8 more than a decade in which a similar proposal to his was adopted. One case is from  
9 New York, which does not use the remaining life technique, and so is not relevant.  
10 That he has cited so few cases illustrates that such approaches are, in fact, quite rare.  
11 In the majority of depreciation studies across the country, the remaining life technique  
12 is used, and an additional amortization is unnecessary.

13 Notably, Mr. Kaufman has not cited any cases from Oregon. He also does not  
14 note that the FERC has rejected his approach and found that it is not consistent with the  
15 Uniform System of Accounts (USofA).

16 **Q. Please discuss the case in which the FERC rejected an amortization of the**  
17 **theoretical reserve imbalance.**

18 A. Progress Energy Florida (now Duke Energy Florida) filed its depreciation study before  
19 the FERC in Docket No. ER11-2584-000. FERC stated in its Order:

1 In this regard we note that this Commission has addressed any alleged  
2 excess or deficiency in depreciation reserves through adjustment of  
3 depreciation rates that eliminate such excess or deficiency over the  
4 remaining life of a utility’s plant, rather than any shorter period.<sup>4</sup>

5 In other words, an accelerated amortization of the reserve was not accepted.

6 Additionally, FERC further stated in Docket No. ER11-3584-000 that:

7 In Order No. 618 and in the February 28 Order, the Commission stated  
8 that the cost of property used in utility operations should be allocated in  
9 a “systematic and rational manner” to periods during which the property  
10 is used in utility operations, i.e., over the property’s remaining estimated  
11 useful service life. For this reason, changes in asset depreciation  
12 estimates, including cost of removal, should be made prospectively over  
13 the asset’s remaining life. Florida Power proposes to adjust its  
14 depreciation reserves by \$65,840,613 in 2010 and intends to adjust its  
15 depreciation reserves by varying amounts in 2011 through 2013 rather  
16 than allocating the excess depreciation reserves over the remaining  
17 service lives of the related utility plant. While these adjustments may be  
18 acceptable for retail ratemaking purposes, they do not conform to our  
19 requirements for allocating the costs of utility plant over their service  
20 lives. Accordingly, we will direct Florida Power to reinstate all such  
21 adjustments to its depreciation reserves (Account 108). Florida Power  
22 must also re-file its 2010 FERC Form No. 1 to reflect the restatement of  
23 its depreciation reserves.<sup>5</sup>

24 **Q. Based on the FERC’s decision cited above, does the FERC consider Mr. Kaufman’s**  
25 **proposal consistent with the USofA?**

---

<sup>4</sup> Order in FERC Docket No. ER11-2584-000, p. 10, footnote 44.

<sup>5</sup> Order in FERC Docket No. ER11-3584-000, paragraph 9. (Emphasis added).

1 A. No. The cited passages above make clear the FERC’s opinion that the USofA requires  
2 that any reserve imbalances be allocated over the remaining lives of a Company’s assets  
3 (e.g., by using the remaining life technique). Mr. Kaufman’s proposal would not  
4 allocate the Company’s costs over the service lives of its assets in a systematic and  
5 rational manner and, therefore, would not be consistent with the USofA. In addition,  
6 there is no explanation or rationale to support why a ten-year amortization period is  
7 appropriate and appears to be arbitrary. Thus, this argument lacks context and support.

8 **Q. Mr. Kaufman claims that the theoretical reserve imbalance means that “future**  
9 **customers are receiving nearly free use” of assets.<sup>6</sup> Is he correct?**

10 A. No. Mr. Kaufman’s statement is based on one very small account that includes assets  
11 he refers to as possibly being “obsolete.”<sup>7</sup> When one considers the rest of the  
12 Company’s accounts, it is clear that Mr. Kaufman fundamentally misunderstands the  
13 Company’s theoretical reserve imbalance. The theoretical reserve imbalance is  
14 developed over the entire history of the Company. It is not only the result of what  
15 current customers have paid but also many previous generations of customers. It does  
16 not mean that there have been intergenerational subsidies. Theoretical reserve  
17 imbalances arise as service life and net characteristics evolve over time and do not  
18 necessarily mean that any generation of customers “over-” or “under-paid.”

---

<sup>6</sup> Kaufman, p. 11, line 16.

<sup>7</sup> Kaufman, p. 11, line 4.



1 **Q. On pages 10 to 12 of his testimony, Mr. Kaufman discusses Account 373.07, Sentinel**  
2 **Lighting Equipment. Please address his discussion of this account.**

3 A. Mr. Kaufman devotes a significant portion of his testimony on an account that is both  
4 unusual and represents a small fraction of the Company’s assets. Specifically, the  
5 balance for Account 373.07 represents less than 0.1% of the Company’s plant in service.  
6 It also has had minimal activity in recent years and has been relatively close to fully  
7 depreciated for many years. It is not reasonable to extrapolate the experience of this  
8 account onto the billions of dollars invested in other accounts that have considerably  
9 more remaining years to recover through depreciation.

10 Further, the specifics of the account do not support Mr. Kaufman’s conclusions.  
11 For example, this account has had an accumulated depreciation reserve that is greater  
12 than the plant in service for the account since at least 2012, and remaining life  
13 depreciation rates corresponding to this have been relatively low as a result.  
14 Thus, customers have not “over-paid” depreciation in this account for many years.  
15 Mr. Kaufman’s proposal would give an even greater subsidy to current customers by  
16 producing negative depreciation expense for this account for the next ten years.  
17 After that, customers would then have to pay higher depreciation rates.  
18 Yet, Mr. Kaufman observes that the assets in this account are possibly obsolete.<sup>8</sup> If this

---

<sup>8</sup> Kaufman, p. 11, line 5

1 is true today, it would make little sense for customers to pay, ten years from now, more  
2 than they have paid since 2012.

3 More important, a similar situation does not occur for larger accounts. Indeed,  
4 the other account Mr. Kaufman discusses – Account 356, Overhead Conductors and  
5 Devices – has over \$84 million remaining to recover through depreciation expense and  
6 is, therefore, not at all comparable. In other words, the unique situation of Account  
7 373.07 does not mean drastic measures are appropriate for other accounts. Indeed, if  
8 one were so inclined, a more targeted adjustment to Account 373.07 could be  
9 accomplished while having minimal effect on the other accounts that comprise more  
10 than 99.9% of the Company’s investments. That is, Mr. Kaufman’s observations about  
11 one isolated account in no way provide support for his much more significant proposal  
12 that affects every account.

13 Further, it should be noted that the TRI for most of the Company’s depreciable  
14 plant accounts (as of the study date of December 31, 2019) is within a range that is  
15 reasonable. The TRI for depreciable plant in total is 19% and for most accounts does  
16 not exceed 30%. The select accounts that Mr. Kaufman uses to illustrate his arguments  
17 are not representative of most of the Company’s accounts.

18 **Q. Does the existence of a theoretical reserve imbalance suggest there is a problem**  
19 **that must be remedied?**

1 A. No. The theoretical reserve and the theoretical reserve imbalance are the result of a  
2 calculation that incorporates many assumptions, and that the theoretical reserve itself is  
3 a simple model of the very complex history of transactions that have resulted in current  
4 accumulated depreciation balances. For this reason, the theoretical reserve almost never  
5 matches the book reserve. The mere existence of a theoretical reserve is a function of  
6 the difficulty of modeling real world utility property and forecasting service life and net  
7 salvage. The theoretical reserve should not be confused with the “correct” book reserve.

8 **Q. If the theoretical reserve is not a perfect measurement of accumulated**  
9 **depreciation, why is it calculated?**

10 A. The calculation of a theoretical reserve is not required, nor is it necessary, when using  
11 the remaining life technique and is not used in the remaining life formula. Some analysts  
12 do not even calculate the theoretical reserve when performing depreciation studies that  
13 are based on the remaining life technique.<sup>9</sup> While the theoretical reserve can serve as a  
14 rough benchmark as to how current estimates compare to depreciation estimates and  
15 plant and reserve activity in the past, it should not be considered the “correct” reserve.  
16 Authoritative depreciation texts are clear that the status of the book reserve as compared  
17 to the theoretical reserve is not a prescription for necessary adjustments to the reserve.

---

<sup>9</sup> Gannett Fleming’s calculations use the theoretical reserve for each vintage of plant to allocate the book reserve to each vintage. However, the theoretical reserve is not used as a basis for any other remaining life calculations. Other depreciation software does not allocate the book reserve to the vintage, and thus does not use the theoretical reserve for the calculations.

1 **Q. What do Mr. Kaufman’s claims assume?**

2 A. There are two important implicit assumptions inherent in his claims that we will discuss  
3 here. These assumptions are:

4 1. Estimates made today are completely accurate.

5 2. Previous depreciation rates for the Company, as accepted by the Commission,  
6 were “incorrect.”

7 We will begin with the first assumption, as the problems with this assumption help to  
8 demonstrate some of the problems with the second.

9 **Q. Is the assumption that estimates made today are completely accurate, a valid**  
10 **assumption?**

11 A. No. The estimation of depreciation is a very complex and difficult task requiring the  
12 forecast of events (e.g., retirements and net salvage) that will take place in the future.  
13 Because the future contains a great deal of uncertainty, the assumption that these  
14 estimates are completely accurate is not reasonable.

15 **Q. Do any authoritative sources support that assessment?**

16 A. Absolutely. Again, NARUC states that:

17 Instances occur where subsequent experience shows the original  
18 estimates no longer to be appropriate. It should be noted that only after  
19 plant has lived its entire useful life will the true depreciation parameters  
20 become known.<sup>10</sup>

---

<sup>10</sup> NARUC, p. 189.

1 Thus, NARUC is quite clear that estimates should not be considered completely  
2 accurate. It follows that the existence of a theoretical reserve imbalance should not be  
3 considered intergenerational inequity. Frank K. Wolf and W. Chester Fitch's  
4 *Depreciation Systems* (Wolf and Fitch) is another highly regarded, authoritative  
5 depreciation text. Wolf and Fitch also comment on the matter, stating:

6 The CAD [theoretical reserve] is not a precise measurement. It is based  
7 on a model that only approximates the complex chain of events that occur  
8 in an actual property group and depends upon forecasts of future life and  
9 salvage. Thus, it serves as a guide to, not a prescription for, adjustments  
10 to the accumulated provision for depreciation.<sup>11</sup>

11 Given the complexities and uncertainties involved in estimating the future, we  
12 should not assume that the estimates in a depreciation study are completely accurate  
13 (which is an assumption inherent in Mr. Kaufman's proposal). They are the best  
14 estimates given the best information available, but we will not know for sure that they  
15 are correct until the plant has lived its entire useful life.<sup>12</sup> In future studies shorter lives  
16 or more negative net salvage may be appropriate, at which point a large negative  
17 theoretical reserve imbalance (or reserve deficiency) would develop if Mr. Kaufman's  
18 proposal was adopted. This would result in an even larger increase in rates (whether the

---

<sup>11</sup> *Depreciation Systems* (1994), Frank K. Wolf and W. Chester Fitch, p. 86.

<sup>12</sup> To put this in context, the average service life estimates in the depreciation study for many accounts are in the 50 to 60-year range. These are only averages though, and the estimates mean that some plant will last longer than 100 years. Thus, based on the service life estimates in the depreciation study, we will not know for certain if the estimates are correct for over 100 years.

1 remaining life technique or another reserve amortization were used). The remaining life  
2 technique provides for more stability in rates by allocating costs over the remaining  
3 lives, whereas Mr. Kaufman’s approach would lead to much more volatility.

4 **Q. Please address the second assumption inherent in Mr. Kaufman’s position that**  
5 **prior estimates were “incorrect.”**

6 A. An understanding that the accuracy of depreciation estimates is unknown until all plant  
7 has lived its full useful life demonstrates the fallacy of the assumption that the existence  
8 of a reserve imbalance means that prior estimates were wrong and previous customers  
9 are subsidizing costs for future customers. To make such an assumption inherently  
10 assumes that today we have perfect knowledge of the future, which is an unrealistic  
11 assumption. Yet this is implicit in Mr. Kaufman’s recommendation to amortize the  
12 theoretical reserve imbalance over a relatively short period of time.

13 Wolf and Fitch explain that the theoretical reserve is a simple model of a  
14 “complex chain of events.” Many of the simplifying assumptions<sup>13</sup> inherent in the  
15 theoretical reserve model are not necessarily reasonable assumptions regarding actual  
16 real-world experience.

17 **Q. What assumptions are inherent in the theoretical reserve model?**

---

<sup>13</sup> The assumptions discussed here are related primarily to assumptions regarding life characteristics. However, one assumption made regarding the way net salvage is normally calculated in the theoretical reserve is that average and future net salvage are equal. This is in fact often not the case, and future net salvage is typically greater than average net salvage. The effect of this assumption is therefore normally to understate the theoretical reserve and overstate an estimated theoretical reserve “excess.”

1 A. One key assumption is that all vintages of plant have the same life characteristics.  
2 While the depreciable groups studied in a depreciation study (based largely on the FERC  
3 USofA) are relatively homogeneous, there is variety within the accounts and not all  
4 assets, much less vintages of assets, will necessarily have the same life characteristics.  
5 For example, different materials may have been used for overhead conductors at  
6 different periods of time. If these different materials have different life characteristics,  
7 then the service life estimates will change naturally over time as the composition of  
8 types of assets in the overhead conductors account changes over time. For this reason,  
9 service life estimates today may be longer than would have been appropriate ten or  
10 twenty years ago. Because the service life estimate for the account is estimated for  
11 assets in service today, this natural change would result in a theoretical reserve  
12 imbalance due to the changing life characteristics over time. However, this does not  
13 necessarily mean that previous depreciation rates were too high, as Mr. Kaufman  
14 implies. Instead, it simply means that the life characteristics for the account are dynamic  
15 and have changed over time. In other words, given that different vintages of plant can  
16 have different life characteristics, it is incorrect to assume that the life estimates made  
17 today should have applied in the past for the entire history of the Company. Yet this is  
18 an assumption of the theoretical reserve model and an assumption Mr. Kaufman makes  
19 in his recommendation for the theoretical reserve imbalance.

20 **Q. Are there other assumptions inherent to the theoretical reserve model?**

1 A. Yes. Another assumption is that life characteristics do not change over time. We have  
2 explained that different vintages of plant can have different life characteristics.  
3 However, the life characteristics themselves can change over time as well. For example,  
4 operational practices, maintenance practices, and management decisions can change life  
5 characteristics over time. A good example is meters. An estimate that meters would  
6 last for 30 years was a reasonable estimate three or four decades ago.  
7 However, experience has shown that this was not a reasonable assumption ten years ago.  
8 The assets themselves did not change - the electromechanical meters 30 years ago were  
9 similar to those in service ten years ago - and the physical characteristics of these meters  
10 did not change. However, other considerations such as functionality or technology did  
11 change, which resulted in a significant change in life characteristics. This example  
12 illustrates that life characteristics do change over time and the theoretical reserve is far  
13 too simplistic an assumption from which to draw the conclusion that previous  
14 depreciation rates resulted in an overpayment.

15 **Q. Do you have further comments related to the claim that previous depreciation rates**  
16 **were too high?**

17 A. Yes. The Company's historical depreciation rates have been based on periodic  
18 depreciation studies in which the Company has presented what it considers to be the  
19 best estimates of depreciation based on the information available at the time.  
20 Other parties have also had the opportunity to present their estimates based on the same



1 information. The Commission has concluded that the depreciation rates used by the  
2 Company were reasonable based on the information available at the time. That is, the  
3 book reserve for PGE is based on the depreciation rates that the Commission has  
4 historically recognized to be just and reasonable.

5 **III. SERVICE LIFE ESTIMATES**

6 **Q. Does Mr. Kaufman propose changes to the service lives determined in the**  
7 **Stipulation?**

8 A. Yes. He proposes changes to the survivor curve estimates for the accounts shown in the  
9 table below. The Stipulating Parties note that, with the exception of Accounts 352 and  
10 356, these are interim survivor curve estimates, and the overall service life is also  
11 determined based on an estimated retirement date. Except for the Sullivan hydro plant,  
12 Mr. Kaufman has not recommended changes to the retirement dates for production  
13 facilities.

| ACCOUNT | STIPULATION ESTIMATE | AWEC PROPOSED ESTIMATE |
|---------|----------------------|------------------------|
| 311     | 90-S1.5              | 98-R3                  |
| 332     | 105-R3               | 120-R3                 |
| 341     | 70-R3                | 80-R3                  |
| 341.01  | 40-R4                | 50-S3                  |
| 344.01  | 30-R3                | 38-R4                  |
| 345     | 50-R2.5              | 60-R3                  |
| 345.01  | 30-S2.5              | 45-S2                  |
| 352     | 70-R2.5              | 75-R2.5                |
| 356     | 65-R2.5              | 70-R2.5                |

14

1    **Q.    Do you agree with Mr. Kaufman’s proposed changes to the estimates for these**  
2       **accounts?**

3    A.    No. Mr. Kaufman’s estimates are based primarily on the mathematical fit of the curves  
4       to the available historic data and do not adequately consider the many other factors that  
5       contribute to selection of an estimated survivor curve.

6    **Q.    Can you provide an example of how Mr. Kaufman’s estimates are not appropriate?**

7    A.    Yes. For account 311, Mr. Kaufman’s basis for the 98-R3 estimate is a statistical fit of  
8       one of the historical experience bands provided in the study along with the support that  
9       some (less than half) of the estimates used for companies in the industry statistics are  
10       over 100 years for this account. While these factors are worth consideration, they do  
11       not include all available information that is relevant to a curve estimate and belie an  
12       understanding of the conditions specific to the account in this case. Survivor estimates  
13       are intended to model the expected conditions for the account in the future. In making  
14       an estimate for this account, for example, it is worth considering that the only assets  
15       remaining in the account are those at the Colstrip location, which for purposes of  
16       depreciation, has an economic life that ends 2025, should the Commission adopt the  
17       Stipulation.

18                Mr. Kaufman’s analysis is focused primarily on the Company’s historic data and  
19       fitting curves to these data sets. It does not appear to give any consideration to what the  
20       future expectations might be for these accounts.

1    **Q.    Do authoritative depreciation sources support your assertion that a comprehensive**  
2    **depreciation study should incorporate factors other than statistical analysis?**

3    A.    Yes. All depreciation texts are clear that service life estimates are forecasts of future  
4    expectations. It is widely understood by depreciation professionals that exclusive  
5    reliance on the statistical analysis of historic data is inappropriate for life estimation.  
6    NARUC’s *Public Utility Depreciation Practices* specifically discusses the impropriety  
7    of solely relying on mathematical analysis of historic data. It further discusses the  
8    subjective nature of life estimation.

9                   Actuarial analysis objectively measures how the company has retired  
10                   investment. The analyst must then judge whether this historical view  
11                   depicts the future life of the property in service. The analyst takes into  
12                   consideration various factors, such as changes in technology, services  
13                   provided, or capital budgets.<sup>14</sup>

14           NARUC also states:

15                   The reason for making an historical life analysis is to develop a sufficient  
16                   understanding of history in order to evaluate whether it is a reasonable  
17                   predictor of the future.<sup>15</sup>

18    **Q.    Have the estimates agreed to by the Stipulating Parties taken into consideration**  
19    **other factors besides the statistical analysis of historic data?**

---

<sup>14</sup> National Association of Regulatory Utility Commissioners, *Public Utility Depreciation Practices*, 1996, p. 111.

<sup>15</sup> National Association of Regulatory Utility Commissioners, *Public Utility Depreciation Practices*, 1996, p. 126. Emphasis added.

1 A. Yes. The estimates agreed upon by the Stipulating Parties were based on the  
2 Depreciation Study that has considered not just the historic data analysis but the  
3 Company’s practices and expectations for the future, the current practices within the  
4 electric industry and knowledge of estimates used by other electric companies.  
5 Further, the Stipulating Parties have knowledge of the Company and its history and have  
6 collectively agreed upon the estimates provided in the Stipulation which are rooted in  
7 estimates that have been accepted by parties in prior cases for PGE.

8 **Q. What change does AWEC propose for the Sullivan production facility?**

9 A. Mr. Kaufman recommends extending the expected retirement date for this facility by 30  
10 years to 2065 based on the potential for relicensing.

11 **Q. Do you agree with the proposed change in retirement date to the Sullivan facility?**

12 A. No. While PGE has general plans to relicense this facility in the future, the facility is  
13 currently licensed to operate through 2035. It is common practice in the industry to use  
14 the license date to establish estimated retirement dates for hydro facilities. As a facility  
15 nears its license date, it may be reasonable to expect a relicensing of the facility.  
16 However, this typically occurs within a few years of the license expiration when it is  
17 more certain that relicensing will be sought and approved. For Sullivan, the current  
18 license does not expire for another 14 years. Over the next 14 years, many things could  
19 change which could affect the outlook for the facility. As a result, it is premature to  
20 extend the retirement date for the Sullivan facility.

1 **Q. What change does AWEC propose for account 344.01 – Wind generators?**

2 A. Mr. Kaufman recommends a 38-R4 type curve that assumes an average service life of  
3 38 years for wind generators.

4 **Q. Do you agree with the proposed change for account 344.01 – Wind generators?**

5 A. No. Although not clearly described in AWEC Exhibit 100, AWEC’s statistical analysis  
6 appears to be based exclusively on PGE plant data. However, to estimate the average  
7 service life for wind generators, additional factors should be considered since PGE’s  
8 12-years history for this account is not sufficient data. As described in the depreciation  
9 study PGE estimated service life parameters for all depreciation accounts, including  
10 Account 344.01, after “compiling historical data for the plant accounts or depreciable  
11 groups, analyzing this history through the use of widely accepted techniques, and  
12 forecasting the survivor characteristics for each depreciable group on the basis of  
13 interpretations of the historical data analyses and the probable future. The combination  
14 of the historical experience and the estimated future yielded estimated survivor curves  
15 from which the average service lives were derived.”<sup>16</sup> Through this procedure PGE  
16 estimated a 35-R3 survivor curve for Account 344.01.

17 **Q. What was OPUC Staff’s proposed survivor curve type for Account 344.01 average**  
18 **service life?**

---

<sup>16</sup> See Depreciation Study, Section I-4

1 A. As previously described in the Stipulating Parties Exhibit 100 at page 7, Staff evaluated  
2 PGE’s curve life combination in a statistical model and proposed a 25-R1 survivor curve  
3 for Account 344.01, which is within the range of majority industry statistic and meets  
4 the wind power industry expectation.

5 **Q. Did the Stipulating Parties reach an agreement for Account 344.01 survivor curve?**

6 A. Yes. As described in the Stipulating Parties Exhibit 100 at page 8, in settlement  
7 discussions, PGE emphasized the minimal retirements in the early service life for this  
8 type of assets due to parts’ warranties and the significant statistical support for specified  
9 industry ranges. After this discussion, the Stipulating Parties agreed to utilize a 30-R3  
10 curve that reflected all the critical factors for life expectancies for PGE’s generator wind  
11 assets.

12 **Q. What is your recommendation related to AWEC’s proposed service life changes?**

13 A. The Stipulating Parties recommend rejecting the service life changes proposed by  
14 Mr. Kaufman, on behalf of AWEC, in favor of the estimates agreed upon in the  
15 Stipulation.

16 **IV. NET SALVAGE ESTIMATES**

17 **Q. Does AWEC propose changes to the net salvage estimates determined in the**  
18 **Stipulation?**

19 A. Yes. He proposes changes to the net salvage estimates for the Transportation Equipment  
20 accounts shown below.

| ACCOUNT | STIPULATION ESTIMATE | AWEC PROPOSED ESTIMATE |
|---------|----------------------|------------------------|
| 392.04  | 15%                  | 18%                    |
| 392.05  | 15%                  | 18%                    |
| 392.06  | 15%                  | 18%                    |
| 392.08  | 15%                  | 18%                    |
| 392.09  | 15%                  | 18%                    |
| 392.10  | 15%                  | 30%                    |

1

2 **Q. Do you agree with Mr. Kaufman’s proposed changes to the net salvage estimates**  
3 **for these accounts?**

4 A. No. As with his life estimate proposals, Mr. Kaufman’s net salvage estimates are based  
5 primarily on historic data and do not include consideration of relevant factors such as  
6 the Company’s practices and outlook.

7 **Q. Does Mr. Kaufman’s approach to net salvage differ from that used in the**  
8 **Depreciation Study?**

9 A. Mr. Kaufman’s approach to net salvage is not significantly different from that used in  
10 the Depreciation Study; however, he did choose to segregate the helicopter subaccount  
11 for the purposes of net salvage analysis. The Depreciation Study analyzed the historic  
12 net salvage data for all Transportation Equipment subaccounts together to determine a  
13 single net salvage estimate to be applied to all the accounts.

14 **Q. Is it necessary to segregate account 392.10 (Helicopter) for the purposes of**  
15 **estimating net salvage?**

1 A. No. Due to the limited historic data available related to each of the Transportation  
2 Equipment subaccounts, the data for all 392 subaccounts were studied together for the  
3 net salvage analysis. Given that all assets within these accounts are treated similarly in  
4 terms of the Company's policies and outlook, this is a valid approach to analysis.  
5 Further, given the percentage of the total depreciable plant that the Transportation  
6 Equipment accounts comprise (less than 1%), there is limited effect on depreciation  
7 when using a single net salvage estimate for all of the 392 accounts versus estimating  
8 net salvage for them individually.

9 **Q. What is your recommendation related to AWEC's proposed net salvage changes?**

10 A. The Stipulating Parties recommend retaining the net salvage estimates agreed upon in  
11 the Stipulation as they are based on not just the historic net salvage recorded by the  
12 Company, but also on PGE's future expectations for these assets.

13 **V. MR. KAUFMAN'S CRITICISMS OF SUPPORT FOR THE STUDY AND**  
14 **DEFICIENCIES WITH HIS PROPOSALS**

15 **Q. Please address Mr. Kaufman's criticisms of the Depreciation Study.**

16 A. Mr. Kaufman criticizes the support of the Depreciation Study and makes  
17 recommendations for what he believes should be included in future filings. It should be  
18 noted that the Depreciation Study report is consistent with studies previously filed with  
19 the Commission and with numerous studies Gannett Fleming has performed across the  
20 country. Also, all parties to the Stipulation reached an agreement based on the Study as



1 filed, and Mr. Kaufman’s concerns were not raised by any other party in reaching the  
2 Stipulation agreement. Furthermore, all parties, including AWEC, had an opportunity  
3 to request direct testimony from PGE when the procedural schedule was discussed and  
4 agreed upon between parties. AWEC did not raise this issue at that time and agreed with  
5 the procedural schedule as adopted by the Administrative Law Judge.

6 The Study included the recommendations for each account along with  
7 supporting calculations and analyses used in determining the recommended service  
8 lives, net salvage, and depreciation rates. Additionally, Staff organized a workshop  
9 wherein PGE’s depreciation consultant, John Spanos, gave an overview of PGE’s filing  
10 with explanations of the methods, procedures, and techniques used to determine the  
11 depreciation rates. There was time for questions and comments. PGE has also  
12 responded to numerous data requests to provide additional materials that were used in  
13 support of the proposed depreciation parameters. This degree of support is not true for  
14 Mr. Kaufman’s proposals. His testimony does not appear to include his recommended  
15 depreciation rates. As a result, it is not possible to review his recommendations and  
16 assess whether they are valid; and therefore, his testimony lacks the context and support  
17 needed to justify that his proposed depreciation parameters are fair, just, and reasonable.

18 **Q. DO THE DEFICIENCIES IN MR. KAUFMAN’S TESTIMONY AND SUPPORT**  
19 **CREATE ISSUES WITH REVIEWING HIS PROPOSALS?**

1 A. Yes. The deficiencies in Mr. Kaufman’s testimony and support are particularly  
2 important because Mr. Kaufman’s recommendations related to the Company’s book  
3 reserve should result in modifications to the calculation of depreciation rates for each  
4 account. Mr. Kaufman’s proposal to amortize the theoretical reserve imbalance of each  
5 account means the depreciation rates should be modified to include his adjusted reserve.  
6 Failing to do so will not result in the full recovery of the Company’s assets.  
7 A mathematically correct calculation based on Mr. Kaufman’s proposal would result in  
8 higher depreciation rates than calculated in the Depreciation Study (which would be  
9 more than offset by Mr. Kaufman’s amortization of the theoretical reserve imbalance).  
10 If Mr. Kaufman did not make this adjustment to the reserve used to calculate his  
11 depreciation rates, then his proposed depreciation rates, combined with his reserve  
12 transfers and amortization, will under-collect depreciation by more than \$600 million.  
13 Mr. Kaufman did not provide the calculations needed to confirm whether his proposals  
14 are mathematically accurate.

15 There is a similar issue with Mr. Kaufman’s proposal to roll the reserves forward  
16 for Accounts 373.07 and 392.10. Not only is this proposal inappropriate policy, but if  
17 it were to be done, then other parameters would also need to be updated to align with  
18 the calculation date. Most notably, the remaining life for these accounts would be  
19 shorter than it would be as of the Depreciation Study test year. Again, because  
20 Mr. Kaufman has not provided adequate documentation of the depreciation rates that

1 result from his recommendation, his proposals cannot be sufficiently reviewed to  
2 confirm their correctness or validity.

3 In summary, there are reasons to believe that Mr. Kaufman has not properly  
4 incorporated his recommendations into the development of reasonable depreciation  
5 rates. Given that he has not provided supporting calculations – much less the actual  
6 depreciation rates he proposes – there is no way to confirm the reasonableness of his  
7 proposals. Thus, AWEC’s proposed changes to the Stipulation agreement should be  
8 rejected.

9 **Q. Does this conclude your rebuttal testimony?**

10 A. Yes.