BEFORE THE CORPORATION COMMISSION OF OKLAHOMA

IN THE MATTER OF THE APPLICATION OF OKLAHOMA GAS AND ELECTRIC COMPANY FOR AN ORDER OF THE COMMISSION AUTHORIZING APPLICANT TO MODIFY ITS RATES, CHARGES, AND TARIFFS FOR RETAIL ELECTRIC SERVICE IN OKLAHOMA	))))))	CAUSE NO. PUD 201700496

Rebuttal Testimony

of

John J. Spanos

on behalf of

Oklahoma Gas and Electric Company

May 29, 2018

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I. INTRODUCTION

Q. Please state your name and address.

A. My name is John J. Spanos. My business address is 207 Senate Avenue, Camp Hill, Pennsylvania 17011.

Q. Are you associated with any firm?

A. Yes. I am associated with the firm of Gannett Fleming Valuation and Rate Consultants, LLC (Gannett Fleming).

Q. Are you the same John J. Spanos that previously filed direct testimony in this proceeding?

A. Yes, I am.

Q. What is the purpose of your rebuttal testimony in this proceeding?

A. I am responding to the direct testimonies filed by Oklahoma Attorney General ("AG") witness William Dunkel; Oklahoma Industrial Energy Consumers ("OIEC") witness David Garrett; and Federal Executive Agencies ("FEA") witness Brian Andrews on deprecation related issues. Specifically, the issues I will address relate to mass property service lives, mass property net salvage, terminal net salvage, life spans of generating facilities, and the depreciation rates for new assets.

Q. Has PUD Staff challenged any of your recommendations?

A. No. PUD Staff witness David Melvin addresses depreciation in his testimony and "recommends the Commission accept the proposed Depreciation Rates as

submitted."[1] Thus, the proposals that differ from mine are those made by the AG, OIEC and FEA witnesses.

Q. Please summarize your testimony.

A. My testimony addresses the numerous claims by AG witness Dunkel aimed at discrediting the methods and estimates used in my study. As my testimony will show, Mr. Dunkel's allegations are unfounded. Further, his recommendations are based on misinterpretation of the sources he cites and are inconsistent with industry-accepted depreciation practices and standards. Also, in many cases, Mr. Dunkel has altered data to achieve his desired outcomes and has engaged in questionable depreciation practices. My testimony also addresses the various recommendations of the other parties, and explains that my recommendations are the most reasonable and consistent with depreciation standards and widely accepted depreciation practices. Specifically, I address the following:

- Mass property service lives. The AG, OIEC and FEA have recommended different service life estimates for certain mass property accounts. The process of estimating service lives for mass property (e.g. transmission and distribution plant accounts) incorporates statistical life analysis but must also make sense. OIEC and FEA have estimated the changes to the largest number of accounts and both parties' estimates are inappropriately based solely on mathematical curve matching. That is, their estimates really apply a mathematical formula without stepping back and considering whether the life estimates make sense given the historical lives and the technology. As a result, both parties' estimates are unreasonable and unrealistic for the property studied. OIEC's witness has also made recommendations that are considerably different than his proposals for the same accounts made only two years ago in the Company's previous study.

[1] Responsive Testimony of David Melvin at 11:12-13.

The AG has recommended adjustments to fewer accounts. One is for street lighting, for which the AG does not properly incorporate the impact of Company plans to convert many assets to LED lighting. The AG's witness also makes a proposal for the Company's Smart Meters that is inconsistent with his proposal for similar assets in a recent case for PSO.

- Mass property and interim net salvage. The AG and OIEC have both recommended different net salvage estimates for certain mass property accounts. One reason for the AG's and OIEC's recommendations is their witnesses' decision to include reimbursements as gross salvage in the analyses of historical net salvage. However, their approach produces unreasonable results, as both parties expect, for example, that third parties will pay the Company over $271 million just to remove all the Company's poles. This is not a reasonable expectation, as it is highly unlikely that anyone would pay the Company such significant sums to simply remove its property. As a result, the AG's and OIEC's net salvage estimates are flawed.

  The AG also has significantly adjusted the Company's net salvage data based on AG witness Dunkel's expectation for what the inflation rate will be over the next half century. However, Mr. Dunkel's adjustments are flawed mathematically and conceptually, as Mr. Dunkel fails to recognize that the average lives of the Company's assets are longer than the time period over which retired assets were in service. Just as egregious are Mr. Dunkel's claims that his method of adjusting the data is supported by a depreciation textbook. However, Mr. Dunkel misrepresents what this text actually says, and had he appropriately followed the instructions of this textbook, his net salvage estimates would have been at least as negative as those I have proposed.
- Life spans of power plants. Most of the recommended life spans for the Company's power plants are not at issue in this proceeding. However, the AG and OIEC have recommended different life span estimates for certain plants based on the Company's 2014 and 2015 Integrated Resource Plans (IRPs). My life spans reflect the most current information from the Company, and the life spans in my study are those that will be reflected in the 2018 IRP that will be released this summer.
- Terminal net salvage for production plant accounts. No party disputes that in order to recover the full cost (original cost less

net salvage) of the Company's assets, the net salvage estimates for production plant accounts should include a component for terminal net salvage, or the decommissioning of the facilities. In order to equitably allocate the Company's terminal net salvage costs, I have escalated the costs in the Company's decommissioning study to the date of each facilities retirement, consistent with the Uniform System of Accounts (USOA). The AG and OIEC have proposed to exclude this escalation, and thus propose to not recover the full future net salvage costs for the Company's production assets. Their approach is not consistent with the USOA (as affirmed by a recent FERC order), and will instead result in a failure to recover the costs of the Company's assets equitably over their service lives. Similarly, Mr. Andrews proposes not to use a straight line method to recover future net salvage costs. His method is inconsistent with standard depreciation practices and will also not equitably recover the Company's future net salvage costs.

- Depreciation Rates for New Facilities. AG witness Dunkel proposes that the depreciation rates for existing generating facilities be used for new facilities the Company will place in service in the coming years. His proposal will not properly match the depreciation of these facilities with their expected lives, and is therefore inappropriate.

II. THE DEPRECIATION STUDY IS BASED ON STANDARD DEPRECIATION PRACTICES

Q. Before addressing the specific issues in your testimony, are there any aspects of the other parties' testimonies that you would like to address?

A. Since AG witness Dunkel devotes so much of his testimony to challenging the credibility of my study, it seems appropriate that I address his allegations regarding my methods and resulting estimates.

Q. What specific criticisms does Mr. Dunkel make regarding your study?

A. There are two separate types of criticisms made by Mr. Dunkel with regard to what he refers to as "credibility" issues with the depreciation study. Some of his criticisms relate to how information provided by the Company was incorporated into my study. These issues are not direct criticisms of depreciation study standards, but are instead disagreements of how certain information should be incorporated into my study. I will address one of these issues, related to street lights, in more detail here. However, some of the other criticisms along these lines will be addressed later in my testimony or will be addressed by other company witnesses.

The fundamental criticisms levied by Mr. Dunkel are focused on two specific issues. The first is Mr. Dunkel's incorrect opinion that future plans should not be included in statistical analyses used to determine the future service lives of the Company's assets, particularly related to the Company's street lighting account. The second is Mr. Dunkel's allegation that I have "altered" the Company's historical data. It is primarily these criticisms upon which Mr. Dunkel makes his recommendation that the Commission "reject" my study.[2] Specifically, Mr. Dunkel argues that because the Commission disagreed with adjustments made to the historical data in a recent PSO case, the same should be true of the instant case. He makes this claim despite that: 1) the adjustment at issue in the PSO case was a different issue and is not relevant to the instant case; 2) any adjustments to the data in the instant case were disclosed to Mr. Dunkel months ago; and 3) Mr. Dunkel has himself significantly altered the historical data in order to make his recommendations.

[2] Direct Testimony of William Dunkel at 5:13-14.

Thus, in this section of my rebuttal testimony, I will focus on these criticisms made by Mr. Dunkel and will explain not only are they without merit, but that it is Mr. Dunkel who has made recommendations that are not consistent with standard depreciation practices. Further, it is Mr. Dunkel who has provided misleading testimony that misrepresents the recommendations of depreciation textbooks.

Q. Please address Mr. Dunkel's allegation that you have "altered" the historical net salvage data.

A. Mr. Dunkel bases this claim on how certain types of transactions, referred to as "reimbursements," were treated in the net salvage analysis in my study. Reimbursements represent payments that the Company receives from third parties in the event that the Company has to replace or relocate property and is compensated for doing so. Typically, these reimbursements occur due to damage (e.g., payments from insurance) or when the Company has to relocate property in its right-of-way due to the needs of, for example, a highway widening project. While these types of transactions may occur occasionally, the payments received are typically much higher than the salvage that most of the Company's assets will receive upon retirement. For this reason, it is often necessary to exclude some or all reimbursements from the net salvage analysis in order to develop a net salvage database that will be more representative of the Company's future experience for the account in general. Mr. Dunkel's allegation that I have "altered" the data is a mischaracterization of the actual process. Excluding outliers when analyzing any database is by no means an

"alteration."

Q. Has the practice of excluding reimbursements been used in previous depreciation studies for the Company?

A. Yes. The practice of excluding reimbursements was employed in the previous depreciation study for OGE and the amounts that were excluded from the net salvage analysis were provided to other parties as they have been in this case. It should be noted that although Mr. Garrett, like Mr. Dunkel, is currently in disagreement with this practice, Mr. Garrett raised no issue in the previous case.

Q. Is it a common practice to exclude reimbursements from the net salvage analysis?

A. Yes. This is addressed in both *Public Utility Depreciation Practices*, published by the National Association of Regulatory Utility Commissioners ("NARUC") and in *Depreciation Systems* by Frank Wolf and Chester Fitch ("Wolf and Fitch"). Mr. Dunkel cites both of these texts in his testimony (including citing NARUC to support his argument with regard to reimbursements), so he should therefore be aware that on page 31 of the NARUC Manual, in the section titled "Depreciation Study Data," NARUC states:

> A reimbursement is a retirement of property for which the company is compensated at the time of retirement through insurance because of the occurrence of a covered incident, or by public authority, customer, or other party as a result of negotiations wherein the property will be removed or relocated for the convenience of the entity desiring the retirement. In the case of insured losses, the payment received may be different from the original cost of the equipment. Thus, treating the reimbursement as normal gross salvage data in studies may give results that are not typical of

> the account as a whole because the insurance payment is not a characteristic of the account in general. Therefore, such retirements and the corresponding salvage should either both be included or excluded from the depreciation study. The accounting for removals should be analyzed to identify the apportionment of monies received among an offset to new construction, gross salvage, and cost of removal.

Given that he has also cited Wolf and Fitch in his testimony, Mr. Dunkel would presumably also be aware that the removal of reimbursed amounts from the historical service life and net salvage database is supported by *Depreciation Systems*. On pages 16 and 17 of Wolf and Fitch's Depreciation Systems, in the Chapter on "Data," the authors explain reimbursed retirements:

> Reimbursed retirement – code 1. A reimbursed retirement is one for which the company is fully compensated at the time of retirement, usually because the retirement occurred earlier than normal as the result of an unusual event. Compensation may be from insurance, from the party who damaged the utility by causing the retirement, or from an individual or public authority who desired or required the relocation or abandonment of the retired property. Usually reimbursed retirements should not be included in analysis to estimate the life and salvage of property whose original investment is recovered through depreciation accruals.

I also note that for many companies, most of the received reimbursement amounts are recorded as Contributions in Aid of Construction and offset plant in service. These amounts (or a large portion of these amounts) are therefore excluded from the net salvage analysis by virtue of not being recorded as gross salvage. Given all of these considerations, it should be clear that my treatment of reimbursements is consistent with accepted practices.

Q. Mr. Dunkel criticizes your study for not "disclosing" the exclusion of

reimbursements. Please address his criticism.

A. Mr. Dunkel's criticism is that because the exclusion of reimbursements was not specifically cited in my study, that I have failed to disclose these transactions. This is simply incorrect and frankly a ridiculous assertion. Because there are thousands of transactions that are considered when preparing a depreciation study, it is not a standard practice to enumerate the treatment of every single transaction in the study. Even without doing so, a depreciation study is quite voluminous in order to provide the supporting documentation for each life and net salvage estimate. For this reason, as Mr. Dunkel knows, a discussion of the treatment of various transactions is provided in discovery rather than in the study itself. In almost every case I have been involved in across the country, this has been the practice – other parties request information on whether various transactions have been excluded from the life or net salvage analysis, and I readily explain my analysis. Mr. Dunkel has been involved in many cases in which I or a colleague at my firm has performed the depreciation study. As is customary, excluded transactions from the analyses are explained in discovery.

Indeed, this is exactly what has happened in the instant case. I provided a list of all transactions that had been excluded from the life or net salvage analyses in discovery on February 5, 2018,[3] only a few weeks after the Company's filing and almost three months prior to Mr. Dunkel (and Mr. Garrett, who also complains about the treatment of reimbursements) filing their testimonies. Thus, the treatment of

[3] See Exhibit WWD-8, page 1 of 13.

reimbursements was disclosed to Mr. Dunkel with ample time for him to review this information and incorporate it into his analysis. Mr. Dunkel's disagreement with my approach to analysis is just that and should not be characterized as complete discrediting of the methods used or, worse yet, an invalidation of the entire study. This would be irresponsible and misleading.

Q. Please address Mr. Dunkel's claim that you have violated depreciation study standards.

A. Mr. Dunkel bases this claim on the fact that I have projected future retirement activity for Account 373, Street Lighting and Signal Systems, based on my understanding of the Company's plans for assets in this account. Mr. Dunkel is mistaken to believe that this approach violates depreciation study standards. It is critical in a depreciation study to develop estimates of the future experience for a Company. If Company plans result in the future being different from the past, then future plans must be incorporated into the estimation of service lives or net salvage.

Q. What does Mr. Dunkel provide to support his assertion?

A. Mr. Dunkel quotes a page from NARUC that discusses the historical life analysis to support his opinion. However, as with many instances in his testimony, he has either taken a quotation out of context or has failed to understand the full text that he cites. NARUC actually supports the opposite of Mr. Dunkel's conclusion.

Mr. Dunkel's citation in support of his opinion is a quote that is only focusing on historical life analysis. However, as one reads further in the Chapter from which Mr. Dunkel cites NARUC is clear about the limitations of the historical life analysis.

For example, NARUC states:

> Depreciation analysts should avoid becoming ensnared in the mechanics of the historical life analysis. The reason for making an historical analysis is to develop of a sufficient understanding of history in order to evaluate whether it is a reasonable predictor of the future. The importance of being aware of circumstances having a direct bearing on the reason for making an historical life analysis cannot be understated. These circumstances, when factored into the analysis, determine the application and limitations of an historical life analysis.[4]

NARUC then goes on to explain how Company plans should be considered when such plans differ from past experience:

> Management might also reveal planned future retirements that follow no historical pattern. In such a case, the analyst could modify the historical retirement pattern to reflect management's plans for retirement of certain facilities.[5]

This summarizes what I have done for Account 373. I have incorporated future retirements consistent with management plans, thereby included future expectations with past transactions. Witness Rowlett explains the Company's plans about street lighting and how recent retirements do not reflect the LED replacement program that OG&E is about to be implementing. For Mr. Dunkel to characterize my approach for this account as a "violation of depreciation standards" is fundamentally incorrect.

Q. Given Mr. Dunkel's criticisms, has he actually followed standard depreciation practices for all of his recommendations?

A. No. This is particularly true for his net salvage recommendations. For net salvage,

[4] National Association of Regulatory Utility Commissioners, *Public Utility Depreciation Practices*, 1996, p. 126.

[5] National Association of Regulatory Utility Commissioners, *Public Utility Depreciation Practices*, 1996, p. 126. (Emphasis added)

not only has Mr. Dunkel proposed a net salvage methodology that does not have widespread acceptance, but he has repeatedly changed his approach to net salvage in recent cases (both in Oklahoma and elsewhere). Given that Mr. Dunkel puts such an emphasis on "depreciation study standards," it would be expected that he follow standard methodologies for all of his recommendations. As I will explain in detail in Section III, he does not do so for net salvage.

Ironically, his criticisms of my study can easily be levied against his own recommendations. Again, one of his criticisms is that I have "altered" the net salvage data. However, as I will discuss later in my testimony, Mr. Dunkel's entire approach to net salvage is based on significantly altering the historical net salvage data by adjusting the level of inflation incorporated into the numbers. The fact that his method of altering the net salvage data is mathematically and conceptually deficient, and not supported by any depreciation texts, only makes his criticisms of my study even more biased.

In another of Mr. Dunkel's criticisms, he argues that the Commission "should not set depreciation rates based on Mr. Spanos' forecasts decades into the future."[6] However, Mr. Dunkel's approach to net salvage is based on his own forecasted speculation of what the future inflation rate will be over more than five decades. Again, his criticisms are more appropriately levied against his own recommendations.

Finally, as I have discussed in this section, Mr. Dunkel's selective quotations from depreciation textbooks are either taken out of context or contradict the intended

[6] Responsive Testimony of William Dunkel at 20:14-15.

meaning. This is a consistent theme with Mr. Dunkel's testimonies (both here and elsewhere), and the same is true for his net salvage recommendations. As I will detail in Section III.B.iii, while Mr. Dunkel claims that he has used a method of adjusting net salvage data that is based on Wolf and Fitch, he has not actually followed the instructions of that text. Instead, his methodology appears to be his own invention, and has no authoritative support. Similar to many of his other quotations from NARUC and Wolf and Fitch, Mr. Dunkel has misrepresented what they actually say. Either way, Mr. Dunkel's presentation of these textbooks and other sources should make clear that his arguments and proposals cannot be relied on.

Q. Please address Mr. Dunkel's statement that, because he often testifies on behalf of regulatory commissions, their staff, or administrative law judges, he understands "that proper depreciation rates should be fair to all parties, including investors, current ratepayers, and future ratepayers."[7]

A. One who intends to be fair would follow accepted depreciation practices, and not, for example, invent new net salvage methodologies in an effort to reduce depreciation expense. Similarly, a sense of fairness would lead one to accurately quote sources cited in testimony. As I have demonstrated (and will explain in more detail later in my testimony), Mr. Dunkel has not done so. I also do not believe that a witness with an interest of fairness would devote half of his testimony to inflammatory allegations against my depreciation study, as Mr. Dunkel has done. Finally, Mr. Dunkel is not a witness for PUD Staff in the instant cause. Instead, PUD witness Melvin addresses

[7] Responsive Testimony of William Dunkel at 3:15-20.

depreciation, and recommends that my study be adopted as filed.[8]

Q. Please summarize your response to Mr. Dunkel's criticisms.

A. Almost half of Mr. Dunkel's testimony is an attempt to discredit my entire study based on his disagreements with certain judgments made in my study. While his testimony is inflammatory, as I have explained in this section, not only do Mr. Dunkel's arguments not stand up to scrutiny, but they would more accurately be levied against his own recommendations. The methods and approaches I have used for my study are consistent with standard depreciation practices and the recommendations of depreciation textbooks. The same cannot be said of Mr. Dunkel's recommendations.

II. MASS PROPERTY SERVICE LIVES

A. The Service Life Recommendations of the AG, OIEC and FEA are not Reasonable Estimates for the Company's Assets

Q. Please summarize the proposals for mass property service lives.

A. For mass property service lives, OG&E, the AG, OIEC and FEA have estimated survivor curves for various plant accounts. PUD Staff has agreed with the estimated survivor curves presented by OG&E. Iowa survivor curves are used by each party to estimate or forecast the average service life, full-life cycle and retirement dispersion pattern. Each party has also incorporated statistical analyses using the retirement rate

[8] Responsive Testimony of David Melvin at 11:12-13.

method of analysis. However, Mr. Dunkel, Mr. Garrett and Mr. Andrews have reached different conclusions for the service lives of various electric transmission and distribution plant accounts, as well as for the interim survivor curve estimates for certain production plant accounts. Because each party has incorporated the same statistical analyses, the differences in estimates are due to different opinions as to what the best estimates of future life expectations are for each account. Sometimes it makes no sense to simply use a curve that adheres mathematically to a set of historical retirement data. As I will explain, the judgments of Mr. Dunkel, Mr. Garrett and Mr. Andrews result in estimates that are not as reasonable for the types of assets studied as those I have recommended in the depreciation study.

Q. What are the differences between the process of estimation you have used and those of Mr. Dunkel, Mr. Garrett and Mr. Andrews?

A. Each takes a different approach, although both Mr. Garrett and Mr. Andrews have used a similar methodology. Both Mr. Garrett and Mr. Andrews have proposed changes to most of the accounts studied, and their approach is to use very little judgment and instead rely on the mechanical results of the statistical life analysis[9]. As a result, neither has performed what should be considered a full depreciation study. As I will explain, the approach to life estimation involves much more than just mathematical results and the absence of judgment can produce very unreasonable

[9] For example, on page 21 of his testimony Mr. Garrett states "[i]n my opinion, the curves I selected for the Company's mass accounts provide a better mathematical and/or visual fit to the observed data." On page 14 of his testimony Mr. Andrews states "[a]ll of my recommendations result in survivor curves that are mathematically and statistically fit OGE data better". Neither discuss the use of judgment or any other factors in their estimates.

and unrealistic results. Both Mr. Garrett and Mr. Andrews have proposed full-life cycles that are for some accounts outside the range of reasonable expectations for the property studied, and as a result each of their estimates should be rejected.

Mr. Dunkel has proposed fewer adjustments, recommending changes to only three mass property accounts and two interim survivor curves for production plant accounts. One of these accounts is for street lighting, which I will discuss in more detail. I will also discuss meters in more detail, as there is limited data for that account to provide any support for Mr. Dunkel's decisions. Mr. Dunkel's proposal for this account is also contradicted by the proposal he made for similar assets in a recent cause for Public Service Company of Oklahoma ("PSO"). For the remaining accounts for which Mr. Dunkel proposes an adjustment, he does not discuss any specific factors that impact his analysis. Accordingly, I disagree with his recommendations for similar reasons to my disagreements with the proposals of Mr. Garrett and Mr. Andrews.

Each of the estimates of Mr. Garrett and Mr. Andrews are based on their incorrect approach to estimating service lives. I will, therefore, not necessarily address each account individually. Instead, I will explain the problems with their approach and the inappropriate proposals that result from their approach.

Q. You have indicated that each witness emphasizes the statistical analysis to support their estimates. Are there any reasons specific to the OG&E study as to why considerations external to the statistical analysis would be more important?

A. Yes. The historical data available for the statistical analysis only spans a twenty-year

period, 1997 through 2016. Because many of the assets studied have lives of 40 to 50 years (or longer), a twenty-year span is a relatively short period of time when compared to the overall life cycles of the assets. In order to put as much emphasis on the statistical results as Mr. Garrett, Mr. Andrews and Mr. Dunkel have done, ideally one would want a longer period of data. However, only twenty years of data are available, and thus factors other than the statistical analysis must be given more consideration.

Q. Please first address Mr. Garrett's and Mr. Andrews' recommendations.

A. Mr. Garrett's proposals appear to be based on little more than simply selecting mathematical best fitting curves from the statistical analysis. The same was true in OG&E's previous depreciation study. One item that illustrates the flaw in Mr. Garrett's approach is that his recommendations for some accounts in the instant case are quite different from his recommendations in the previous study. For example, for Account 360.2, Land Rights, Mr. Garrett recommends a 70-S4 survivor curve, which has an average service life of 70 years. In OG&E's previous study, Mr. Garrett recommended an average service life for the same account of 99 years. The current study only has two additional years of data, and there have not been any changes significant enough to result in Mr. Garrett's expectation that the same assets will now last, on average, 29 years shorter than he believed would be the case two years ago. Instead, his inconsistent proposals are the result of his inappropriate and flawed approach to estimating service lives.

Similarly, Mr. Andrews' only focus appears to be the degree of mathematical

fitting of various survivor curves. Neither Mr. Garrett nor Mr. Andrews has used an accepted approach to estimating service lives. Instead, judgment must be used to ensure that the study produces reasonable and realistic estimates of service life.

Q. Do any authoritative depreciation texts support your assertion that a comprehensive depreciation study should incorporate factors other than statistical analysis?

A. Yes, all depreciation texts are clear that service life estimates are forecasts of future expectations. It is widely understood by depreciation professionals that sole reliance on the statistical analysis of historical data is inappropriate for life estimation.

Q. Does the NARUC manual support OIEC's and FEA's dependence on only the mathematical analysis for their service life estimates?

A. No. In fact, NARUC advises the opposite of Mr. Garrett and Mr. Andrews' approaches. NARUC specifically states that "depreciation analysts should avoid becoming ensnared in the mechanics of the historical life study and relying solely on mathematical solutions."[10] That is, the NARUC Manual clearly states that service lives should not be estimated in the manner Mr. Garrett and Mr. Andrews have utilized.

Q. You have also referred to "judgment" or "informed judgment" as being necessary to a proper depreciation study. Does the NARUC manual discuss that subject?

A. Yes, it does. The NARUC Manual discusses the use of "informed judgment" in

[10] NARUC, Public Utility Depreciation Practices, 1996, p. 126

detail on page 128, explaining that "the use of informed judgment can be a major factor in forecasting." NARUC then explains:

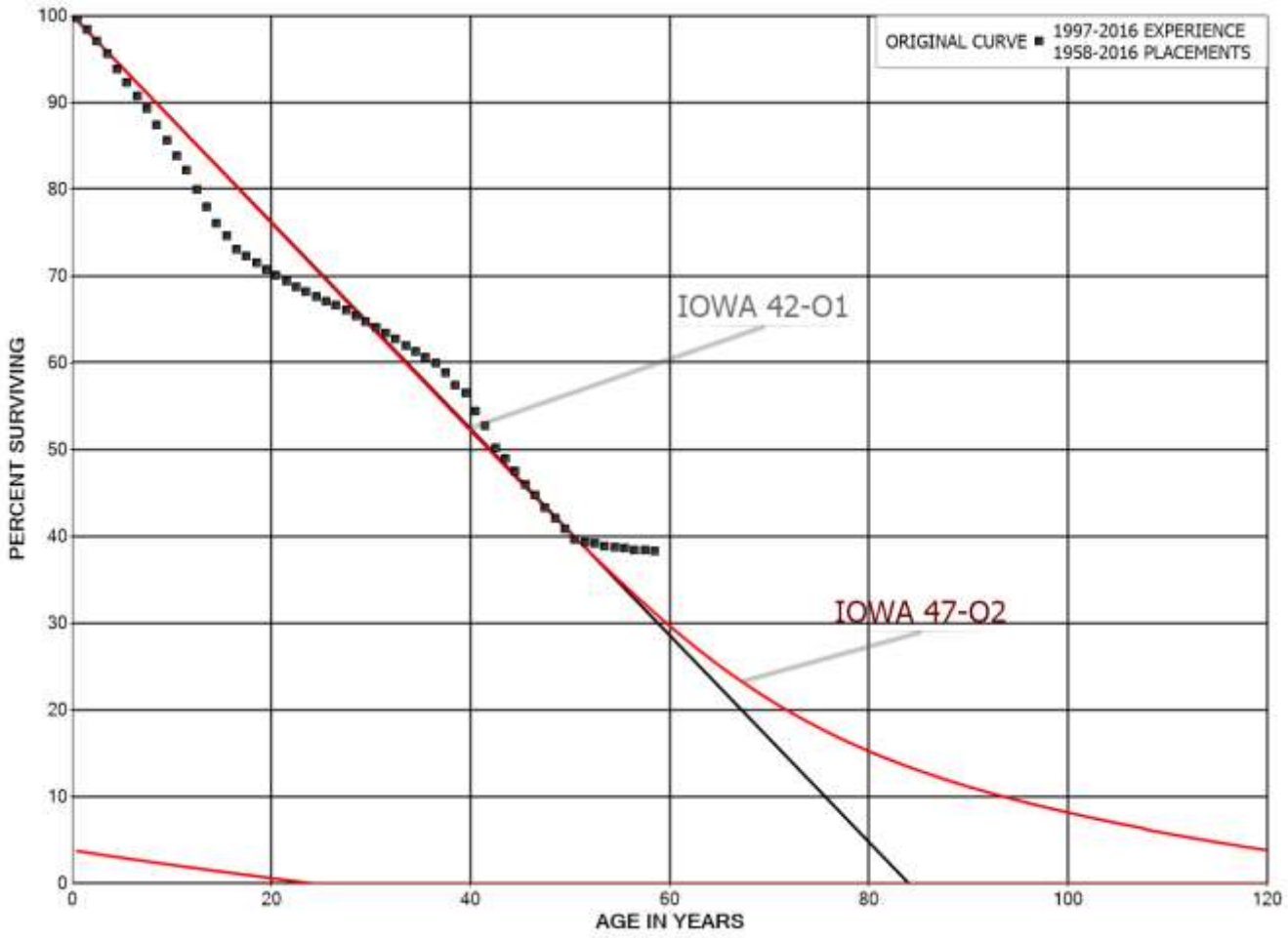
> Judgment is not necessarily limited to forecasting and is used in situations where little current data are available. The analysis gathers what is known about a particular situation and modifies and refines the data to reflect the actual circumstances. The analyst's role in performing the study is to review the results and determine if they represent the mortality characteristics of the property. Using judgment, the analyst considers such things as personal experience, maintenance policies, past company studies, and other company owned equipment to determine if the stub curve represents this class of property.

The Company's depreciation study incorporated these considerations. Mr. Garrett and Mr. Andrews did not do so. As a result, their studies produce unrealistic results that do not represent the mortality characteristics of the property studied.

Q. Can you provide an example of an account for which Mr. Garrett's approach produces inappropriate or unreasonable results?

A. Yes. One example is Account 368, Line Transformers. Mr. Garrett's and Mr. Andrews' estimates (both have made the same estimate for this account), as well as mine, are shown in Figure 1 below. This account helps to demonstrate that their approaches result in unreasonable estimates. It also illustrates that, while both claim that their recommendations better match the historical data, often the differences in estimates are not the fitting of historical data, but instead the projections they have made with their estimates. Indeed, the primary difference for this account is that both Mr. Andrews and Mr. Garrett forecast very different experience for the portion of the curve beyond which sufficient data is available.

Figure 1: Comparison of Survivor Curves for Account 368, Line Transformers



In comparing the two curves, the graph shows that both start out as very similar fits for the actual historical data shown in the graph (the historical data is shown as black squares). Indeed, the two curves are nearly indistinguishable for the ages in which the historical data is shown (i.e., through about age 59).

However, the two curves differ dramatically after this age. My estimate (the 42-O1 curve) projects that retirements will continue at the same rate as they have through age 56. However, Mr. Garrett and Mr. Andrews' use of the O2 curve negates

the fact that future retirements will continue at the same rate. Instead, their estimate assumes that after about age 60 the rate of retirements will slow dramatically. They project that somewhat more than a quarter of the assets in the account will be in service for 60 years, but then inexplicable project that a high percentage of those that make it to 60 years will remain in service over 100 years. This is not a reasonable expectation for the type of property in this account. This is especially unreasonable given the development of new technologies. It is simply not credible that such a large percentage of transformers would last past 80 years and some as long as 120 years.

Q. Is the O2 curve a commonly used curve for utility property?

A. No. The O2 curve is rarely, if ever used for utility property. This is because of the retirement pattern described above and shown in Figure 1, in which a portion of the assets in the account survive much, much longer than the remainder of the account.

Q. Do Mr. Garrett's and Mr. Andrews' estimates for other accounts suffer from the same issues?

A. Yes. Both have used the same inappropriate approach to life estimation for each account. As a result, each of their estimates suffer from the same problems as this account.

B. Account 373, Street Lighting and Signal Systems

Q. What is the reason for the differences in estimates for Account 373, Street

Lighting and Signal Systems?

A. The primary reason for the differences in estimates between my estimates and those of the AG and OIEC is that I have incorporated into my analysis Company plans to replace existing street lighting with LEDs. FEA witness Andrews uses the same projected data that I have used, but his recommendation suffers from the same issues I have addressed in the previous section. In particular, he focuses just on the mathematical curve fitting.

Thus, the primary issue for this account as it relates to Mr. Dunkel and Mr. Garrett's proposals is how Company plans should be incorporated into the net salvage estimate. I have projected the retirements that will result from the Company's plans and incorporated these retirements into the statistical analysis. This provides statistical support for what will be the future retirement experience for the account. Both Mr. Dunkel and Mr. Garrett have elected not to incorporate this information into their analyses, and instead opted to base their estimates on the analysis of only historical information (with some judgment incorporated into their proposals). Because the future experience for this account will be quite different for this account, their approach is not appropriate.

Q. Is it an accepted practice to incorporate expected future activity into the estimation of service lives?

A. Yes. I have explained in Section II that this practice is supported by NARUC. More fundamentally, while I can understand that there could be differences of opinion on what future expectations should be, it is surprising to me that any depreciation

professional would object to incorporating such projections into their analysis on a conceptual basis. The purpose of a depreciation study is to estimate the future life and net salvage characteristics of the property currently in service. While the study of past activity can be a useful tool to assist with estimating the future, the past is of little value if the future will be different from the past. To the extent projections of future activity can be incorporated into the life analysis in order to provide an analytical basis for an estimate of future service lives, it is perfectly reasonable to incorporate this activity. To not do so, as both Mr. Dunkel and Mr. Garrett have done, results in a statistical life analysis that is not reflective of the service lives that should be expected for the Company's street lighting assets.

Q. Both Mr. Dunkel and Mr. Garrett criticize your projections of the future retirements for this account. Please address these criticisms.

A. It is first important to explain how my projected retirements were developed. The Company plans to replace existing street lights, and some of the related assets, by 2028. While the exact timing of each replacement is not known, the Company maintains plans to replace the related assets from 2017 through 2028. Additionally, these retirements will not replace the entire account. Only the luminaires as well as some of the related fixtures and other assets will be affected.

Because the exact timing of all of the replacements is not known, I have assumed for the study that an equal amount will be replaced each year through 2028. While this may not match exactly with the actual timing of future LED replacements, in my judgment it is a reasonable estimate of the future retirement activity for this

account. Additionally, I have only assumed retirements for the assets that will be affected by the LED program (this information was provided to me by the Company).

Mr. Dunkel's criticisms are that because the 2017 recorded retirements were different from my projections; this should discredit all of my projections. However, this difference is not unexpected – as I explained, the exact timing of replacements is not known. However, the fact that retirements were less than the projections for 2017 does not mean that the overall projection that these assets will be replaced by 2028 is incorrect. Instead, it simply means that more lighting will be replaced from 2018-2028 than was included in my projection. The total replacements expected to occur by the end of 2028 is still the same. While it would be ideal to have the exact timing of replacements incorporated into the projections, having some of the timing off should not materially change the results. Instead, Mr. Dunkel's and Mr. Garrett's approach to not include these projections results in a statistical analysis that will be very different from the actual future plans of the Company.

C. Account 370, Meters – Smart Meters

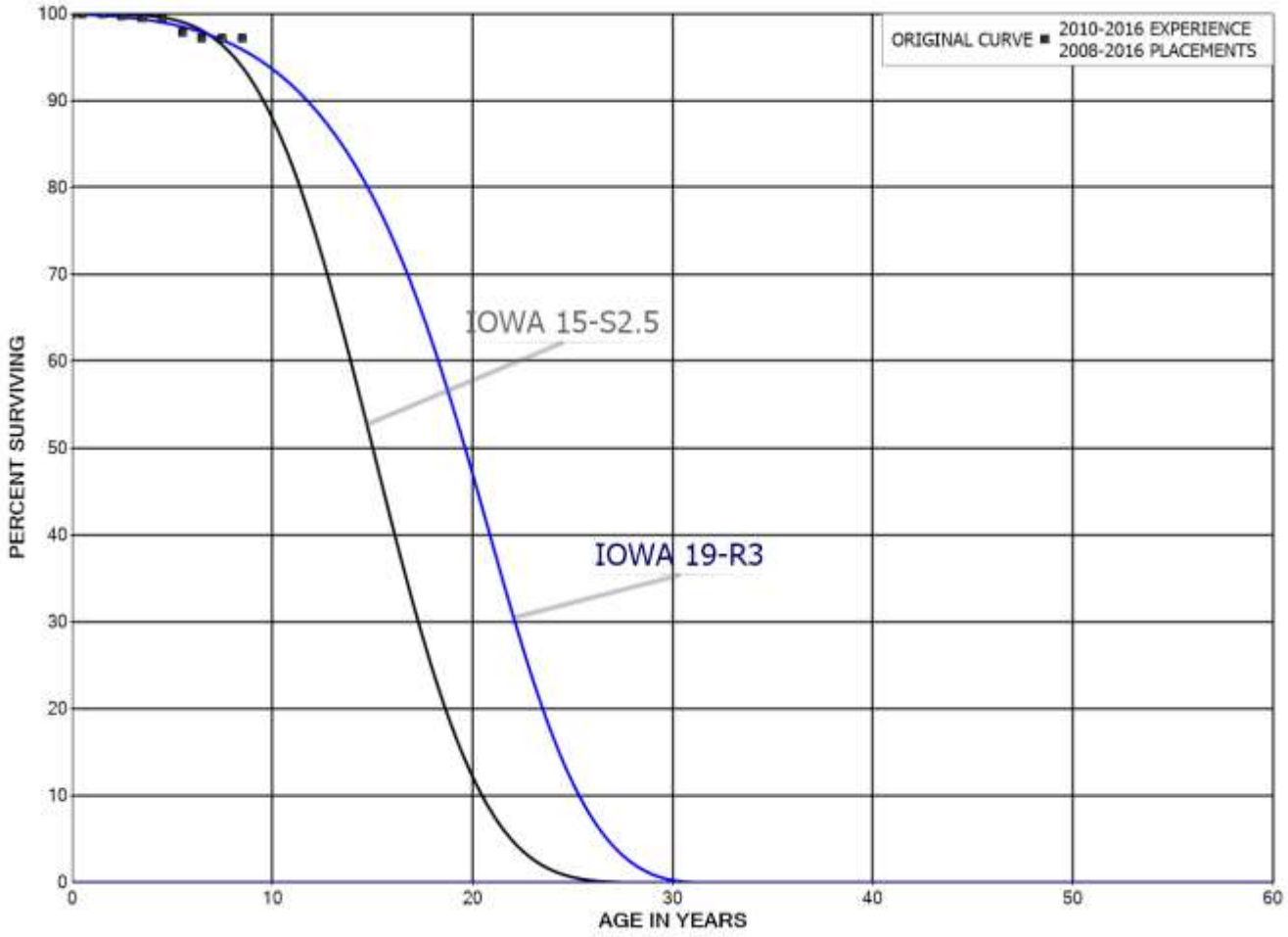
Q. What have you proposed for Account 370, Meters – Smart Meters?

A. For this account I have proposed the 15-S2.5 survivor curve. This is the same survivor curve that the Commission has previously approved for both OG&E and for PSO. The assets in this account are new technologies of meters, and therefore there is limited historical data for this account. For this reason alone, there is little justification for changing the service life estimate for this account.

Q. What has Mr. Dunkel proposed for this account?

A. Mr. Dunkel has proposed the 19-R3 survivor curve. His testimony provides no explanation for his reason for this change, other than to show a graph of his curve compared to the relatively limited data for the account. Figure 2 below compares Mr. Dunkel's estimate to my estimate and the Company's historical data. As the figure illustrates, there is little historical data for this account. Further, because the Company has installed the majority of its Smart Meters since 2011, the latter data points shown in the graph (e.g., for ages 7.5 and 8.5) are based on minimal data and provide little value to the life analysis. However, Mr. Dunkel appears to have inappropriately relied on these data points to increase the service life for this account. Given all of these considerations, the data does not provide a valid reason to increase the service life for this account.

Figure 2: Comparison of Survivor Curves for Account 370, Meters – Smart Meters



Q. Mr. Dunkel recently testified in PSO's most recent cause. Is his proposal for OG&E consistent with his recommendation for PSO?

A. No. Mr. Dunkel recommended the same 15-S2.5 survivor curve for PSO[11] as I have proposed for OG&E in the instant cause. He provides no reason as to why he believes OG&E's meters will last, on average, more than 25% longer than those of PSO. Given the limited historical data and the inconsistencies in Mr. Dunkel's proposals, there is no reason to adopt his proposal to increase the service life for the

[11] See page 16 of Attachment WWD-21 to Mr. Dunkel's testimony in Cause No. PUD 201700151.

Company's Smart Meters. Further, due to factors such as obsolescence, there is reason to be cautious with regard to extending the life for this account. As with many new technologies, functionality for Smart Meters has evolved over time and older Smart Meters do not have the same capabilities as newer technologies of meters. Additionally, as technologies age, vendors often do not support older technologies. These factors support that the average service life for this account should not be increased, particularly because Mr. Dunkel has provided no reason in his testimony for proposing a longer service life for this account than those approved by the Commission for both OG&E and PSO.

III. NET SALVAGE FOR MASS PROPERTY

Q. What is net salvage?

A. Net salvage as used in depreciation is defined as gross salvage less cost of removal. When an asset is retired, it may have scrap or reuse value, which is gross salvage. There is also a cost to retire the asset (also referred to as cost of removal). For example, the retirement of a distribution pole typically requires a multiple person crew and heavy equipment to remove the pole from the ground and cut the pole for disposal. There may also be disposal costs for the pole. All the costs associated with the retirement are cost of removal.

Q. How is net salvage estimated?

A. The method of estimating net salvage depends on the type of property studied. For production facilities, net salvage costs related to decommissioning the facilities are

typically estimated with detailed decommissioning studies. I will discuss the net salvage for production accounts in Section IV. In this section I will focus on the estimation of net salvage for mass property accounts. Because the same method is used to estimate interim net salvage for production accounts, this section of my testimony also addresses the interim net salvage recommendations of the other parties.

For mass property accounts, net salvage is expressed as a percentage of the original cost retired. For example, if an account has a net salvage estimate of negative 50 percent, then a $1,000 asset would be expected to, on average, cost $500 to retire, net of any gross salvage. Net salvage estimates are based on a combination of statistical analysis of historical data, as well as informed judgment that incorporates other factors.

Q. How is the statistical analysis performed?

A. The traditional and widely accepted method of statistical analysis for net salvage is performed by comparing historical cost of removal and gross salvage to historical retirements as recorded in a utility's property records. For this analysis, cost of removal, gross salvage, and net salvage are expressed as a percentage of the original cost of plant retired. By analyzing both annual activity and various multiple term averages of the experienced net salvage expressed as a percentage of retirements, this analysis of the data provides a statistical basis for the estimation of net salvage. This is the method of statistical analysis that I have used in the Depreciation Study. I will refer to this method of analysis as the "traditional method of net salvage analysis" or

the "traditional net salvage analysis" because it is the predominant method of net salvage analysis used for depreciation studies.

Q. Is this method of statistical analysis for net salvage that you have used in the Depreciation Study supported by depreciation textbooks?

A. Yes. The textbooks are the National Association of Regulatory Utility Commissioners' (NARUC) publication *Public Utility Depreciation Practices* and *Depreciation Systems* by Frank Wolf and Chester Fitch (Wolf and Fitch) are two authoritative texts. Both textbooks support the method of statistical analysis I have used in the Depreciation Study. Mr. Dunkel cites these depreciation textbooks in his testimony in support of his recommendations.

NARUC explains that "net salvage is expressed as a percentage of plant retired by dividing the dollars of net salvage by the dollars of original cost of plant retired."[12] Wolf and Fitch also explain that net salvage is expressed as a percentage of the original cost of plant retired, noting "the SR [Salvage Ratio] is the salvage divided by the original cost of the retirements and usually is expressed as a percentage."[13] Thus, both texts support the exact type of analysis I have used in the Company's Depreciation Study.

Q. What are the reasons for differences in mass property net salvage estimates between you and the other parties?

A. The only other party to challenge my net salvage estimates is OIEC. There are two

[12] *Public Utility Depreciation Practices,* National Association of Regulatory Utility Commissioners, 1996, p. 18.

[13] *Depreciation Systems*, Frank Wolf and Chester Fitch, 1994, p. 261. Note that, in this context, Wolf and

primary reasons for the differences in estimates. The first is the disagreement over whether reimbursements should be included or excluded from the net salvage analysis. I have addressed this issue to some degree in Section II, and will address it more in the next section. I note that the only reason for the differences between Mr. Garrett's estimates and mine is the issue of reimbursements.

In additional to including reimbursements, Mr. Dunkel has also adjusted the historical data to what he presumes to be the future inflation rate that will occur over the next half century or more. However, not only is Mr. Dunkel's approach to adjusting the data not an accepted practice in the industry, but his adjustments include mathematical and conceptual flaws. Additionally, while Mr. Dunkel claims that his approach is supported by Wolf and Fitch, he has misrepresented what that text actually says and has not followed the instructions in Wolf and Fitch.

A. Exclusion of Some Reimbursements from the Net Salvage Analysis

Q. Please explain the net salvage issue related to reimbursements.

A. As I have explained in Section II, reimbursements are amounts received by the Company for third parties as compensation for the retirement or replacement of assets. Reimbursements are typically received for insurance (e.g., if a pole is damaged) or when a third party requires the Company to move a transmission or distribution line (e.g., for a highway widening project). Reimbursements are not

Fitch use the term "salvage" to mean "net salvage."

received for most assets, and, while there may be some level of reimbursements each year, they will not be common for the vast majority of the assets retired.

Q. Is it an accepted practice to remove reimbursements from the net salvage analysis?

A. Yes. As I discussed in Section III, the practice of excluding reimbursements from the net salvage analysis is supported by both NARUC and by Wolf and Fitch. Because most assets will not be reimbursed when retired, including all reimbursements in the net salvage analysis tends to skew the historical net salvage data. Reimbursements are often more common in the historical data than will happen for the full population of assets.[14] As a result, the inclusion of all reimbursements tends to overstate the overall gross salvage as a percentage of retirements.

Q. Were all reimbursements excluded from the net salvage analysis?

A. No, not all have been removed. Instead, I have removed the reimbursements that are the least representative of the account in general (i.e., the experience for most of the assets in the account). Most that were excluded were related to major highway widenings.

Q. Has the same practice been used in previous depreciation studies for reimbursements?

A. Yes. The same practice has been used in previous studies for the Company. This is noteworthy because Mr. Garrett testified in the previous depreciation study. Just as

[14] Reimbursements are more common (and tend to have a higher value) when assets are younger. Because the historical data is based on retirements that are, on average, quite a bit younger than the full population, the historical net salvage tends to overstate reimbursements – even if they are expected to recur with some

with this study, a list of all transactions excluded from the analysis was provided in discovery. Mr. Garrett did not raise any issues with the practice of excluding reimbursements in the Company's previous study.

Q. Please address Mr. Garrett's claim that you either "made a mistake" or "did not respond in good faith" to one of his data requests.

A. Mr. Garrett references a data request in which he asked for all data "utilized in the depreciation study." In my response, I referred Mr. Garrett to discovery responses previously provided to the AG, which included a listing of all transactions excluded from the depreciation study.[15] It is unclear why Mr. Garrett has taken umbrage with my response, as not only had the data been provided to parties before he even received my response, but the response referred him to the information he complains of not receiving. Not only that, but Mr. Garrett should have been aware of the exclusion of reimbursements, since the same practice was used (and provided in discovery) in the Company's previous case.

Q. Please provide an example of how the inclusion of reimbursements overstates the future gross salvage, and understates the negative net salvage, for an account.

A. Consider Account 364, Poles, Towers and Fixtures, which is discussed by both Mr. Dunkel and by Mr. Garrett. Most poles, when retired, have little salvage value. There may even be disposal costs for chemically treated poles. However, if the

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frequency.

[15] See the response to OIEC 11-1.

historical data is studied including reimbursements (as both Mr. Dunkel and Mr. Garrett recommend), then the overall gross salvage percentage in the historical data is 44 percent.[16] Based on the December 31, 2016 plant balance of $616 million, applying a 44 percent gross salvage percentage results in a total future gross salvage (including reimbursements) of about $271 million. Thus, if Mr. Dunkel and Mr. Garrett believe that the reimbursements should be included to estimate future net salvage, then it follows that they expect that third parties will pay the Company $271 million to remove its distribution poles (whether from reimbursements or scrap).[17] Assuming that unique reimbursement events are going to be part of the future salvage value for all poles, towers and fixtures is unrealistic. In my professional judgment, it is highly unlikely that a utility would be paid that much to remove its poles. For this reason, in order to have a historical database that is more reasonable to estimate future net salvage, the appropriate approach is to remove the reimbursements I have excluded from the analysis.

Q. Given that you have explained that it is appropriate and consistent with depreciation practices to exclude the data you have excluded, how does this impact Mr. Garrett's and Mr. Dunkel's net salvage recommendations.

A. Mr. Garrett's net salvage recommendations are based on including the reimbursement amounts that I have excluded. This is the only issue for mass property net salvage

[16] Equal to the $20.8 million in gross salvage shown on page VIII-44 of the depreciation study, plus an additional $9.1 million in reimbursements, divided by the $67.7 million in retirements shown on page VIII-44.
[17] To put this further into context, the Company has over 700,000 distribution poles. Mr. Dunkel and Mr. Garrett's expectation is, therefore, that a third party will pay the Company almost $400, on average, to retire each of its distribution poles. This is an unreasonable expectation.

discussed in Mr. Garrett's testimony. Given the unreasonable results that arise from his approach, Mr. Garrett's net salvage recommendations are not reasonable or appropriate. It makes no sense to include historical reimbursements in the gross salvage calculation because they are not representative of future gross salvage. While these types of transactions may occur occasionally, the payments received are typically much higher than the salvage that most of the Company's assets will receive upon retirement. Mr. Dunkel not only makes the mistake of including reimbursements in the gross salvage number, but he also makes significant alterations to the historical net salvage data for his analysis. As I will explain in the next section, his adjustments are also inappropriate and are not based on accepted methodologies. Further, Mr. Dunkel misrepresents the actual text of Wolf and Fitch, the source he uses to support his proposal.

B. Mr. Dunkel's Net Salvage Method is Inappropriate and Not Widely Accepted

Q. For mass property net salvage, what are the reasons Mr. Dunkel's estimates are different from your estimates?

A. In addition to the inclusion of reimbursements, Mr. Dunkel's estimates differ from mine due to adjustments he has made to the historical data for these accounts. Specifically, Mr. Dunkel has modified historical cost of removal and gross salvage to adjust for what he presumes to be differences between historical inflation and his estimate of what the inflation rate will be in the future. That is, while Mr. Dunkel

alleges I have "altered" the Company's data,[18] it is actually Mr. Dunkel who alters the historical data used in his analyses.

I am not familiar with a single regulatory jurisdiction that has adopted Mr. Dunkel's approach to the net salvage analysis, and in the one instance I am aware of in which his proposed method of analysis was proposed, it was rejected. This is not surprising, because his adjustments to the data suffer from flaws in his analysis that cause his results to be unreliable.

Q. You explained previously that NARUC and Wolf and Fitch support the net salvage analysis that you have performed. Do either of these textbooks support the net salvage analysis Mr. Dunkel has performed?

A. No. Although Mr. Dunkel cites to NARUC in his testimony, NARUC does not describe or support the actual type of analysis Mr. Dunkel has performed. Similarly, as I will explain in more detail in Section III.B.iii., although Mr. Dunkel claims that his methodology is supported by Wolf and Fitch, he has not actually performed the analyses described in the portions of this text that he cites.

Q. What are the flaws in Mr. Dunkel's analysis?

A. There are multiple flaws, which I will detail in the sections that follow. One flaw is that Mr. Dunkel has focused only on the inflation rate and fails to recognize that the time period over which inflation occurs can have at least as much of an impact as the inflation rate. Further, Mr. Dunkel supports his methodology for adjusting the data by citing a discussion of complex mathematical models for analyzing net salvage that

[18] Responsive Testimony of William Dunkel at 12:9-15.

are set forth in Wolf and Fitch. However, Mr. Dunkel has not actually performed the analyses set forth in Wolf and Fitch that he claims to have used. Mr. Dunkel's testimony fails to follow the instructions of the actual text and fails to incorporate important concepts set forth in Wolf and Fitch.

Lastly, Mr. Dunkel's adjustments are based on his estimate of future inflation rates, and even relatively small changes in the estimate of future inflation can materially impact the results of his analysis. Because the assets in question for this case are relatively long-lived property that will be in service for 50 years or more, Mr. Dunkel's analysis requires an accurate estimate of what the annual inflation rate will be for over half a century. I am not familiar with any reliable professional inflation forecasts that cover such long periods of time. Further, there are numerous reasons to doubt Mr. Dunkel's estimate of future inflation, and thus there is no compelling reason to substitute his forecast for the Company's actual historical experience. This is particularly relevant given that Mr. Dunkel argues that the Commission "should not set depreciation rates based on Mr. Spanos's forecasts decades into the future,"[19] and yet expects the Commission to substitute his forecast of inflation over the next half century for the Company's actual experience.

i. <u>Mr. Dunkel Overstates the Level of Inflation in the Traditional Net Salvage Analysis</u>

[19] Responsive Testimony of William Dunkel at 20:14-15.

Q. What is the basis for Mr. Dunkel's adjustments to the historical net salvage data?

A. Mr. Dunkel bases his adjustments to the historical net salvage data on his contention that the level of historical inflation incorporated into the traditional net salvage analysis is higher than the level of future inflation that he expects to occur.[20] Mr. Dunkel proposes a method of analysis to alter the data so that the level of inflation in the historical data is replaced with a lower level of inflation that he expects to occur in the future.[21] However, Mr. Dunkel's analysis suffers from two important flaws. First, Mr. Dunkel fails to properly consider the difference in time periods between the age of retirements in the historical data and the expected lives of assets currently in service. Second, Mr. Dunkel's analysis is contingent on the assumption that his estimate of future inflation, which is based on a relatively short-term inflation target, will be accurate for 50 years or more. The first of these flaws demonstrates that Mr. Dunkel's analysis is fundamentally incorrect. The second flaw demonstrates that Mr. Dunkel's analysis is, in my view, based on an assumption that is uncertain, unreasonable and simplistic.

Q. What is inflation?

A. Inflation is defined to be a general increase in prices or fall in the purchasing value of

[20] For example, on page 13 of his Direct Testimony, Mr. Dunkel states that he "did consider the amount of high historic inflation incorporated in Company's historic net salvage analysis."

[21] For example, on page 43 of his Direct Testimony, Mr. Dunkel describes his method by stating, "[o]nce the salvage amounts are stated at the same price level of the retired plant, and the impact of the high historic inflation levels have been removed, the next step is to use a more reasonable estimate of inflation to aid in forecasting the future net salvage amounts."

money. In the context of Mr. Dunkel's testimony, he uses the term to describe the change in costs over time (e.g., removal costs or the original cost of assets placed into service). As such, there are two key inputs in determining the level of inflation: (1) the rate of inflation and (2) the time period over which inflation occurs. Both have an impact on the overall level of inflation. Importantly, Mr. Dunkel's testimony and his calculations only focus on the first of these inputs.[22] Mr. Dunkel does not properly consider that the time period over which inflation occurs can have just as much of an impact as the rate of inflation, if not more.

Q. How does Mr. Dunkel support his contention that the historical inflation in the statistical analysis is higher than should be incorporated into the net salvage analysis?

A. Mr. Dunkel observes that the inflation rate was high in the 1970s and 1980s. He argues that my recommendations "[assume] that the same high inflation rates will continue in the future."[23] This statement is incorrect. Although there were some years in the past that had relatively high inflation rates, the overall time period over which any inflation included in the historical net salvage analysis occurred is typically less than the overall time period that Company's current assets will be in service. As a result, it is fundamentally incorrect to state that the historical net salvage analysis assumes that the same inflation rate will continue in the future.

Q. Why is the overall time period included in the net salvage analysis less than the

[22] Additionally, as I will discuss in Section III.B.ii, there are reasons to doubt Mr. Dunkel's use of the Consumer Price Index as a reasonable measure of the changes in removal costs over time. That is, there are also problems with Mr. Dunkel's assumptions with regard to the rate of inflation.

overall time period that the Company's assets will be in service?

A. For most real-world property groups, the average age at which assets have historically been retired is less than the overall average service life of the group. As an example to illustrate this concept, consider a group of 20 poles. If one pole is retired each year over a 20-year period, then the group will have an average service life of 10 years.[24] However, if after the tenth year one were to observe the average age at which retirements have occurred, one would find that average age to be only five years.[25] Thus, the average age of retirements is less than the average service life.

Further, for assets that are currently in service, the overall average life expectancy (or the "probable life" of the group) will be greater than the average service life (unless every asset is brand new). The probable life is equal to the average service life at age zero, but increases with age. In this example, the probable life at age 10 is 15 years.[26]

To further explain this concept, consider that the average life expectancy of an American at birth is a little less than 80 years (to put this in depreciation terms, the average service life of an American is a little less than 80 years). However, a person who is 80 years of age is not expected to die the next day. Instead, their remaining life expectancy is longer than zero and their overall life expectancy (or probable life)

[23] Responsive Testimony of William Dunkel at 42:1-3.
[24] The assets in this group will have lives of 0.5, 1.5, 2.5, . . ., 18.5, and 19.5 years, as one asset from the group will be retired at the midpoint of each year. The average of these lives is (0.5 x 1 + 1.5 x 1 + . . . + 18.5 x 1 + 19.5 x 1) / 20 = 10 years.
[25] At age 10, retirements recorded to date would have occurred at ages 0.5, 1.5, . . ., 8.5, and 9.5. The average of these ages is (0.5 x 1 + 1.5 x 1 + . . . + 8.5 x 1 + 9.5 x 1) / 10 = 5 years.
[26] At age 10, the remaining assets will have lives of 10.5, 11.5, . . ., 18.5, and 19.5 years. The average of these lives is (10.5 x 1 + 11.5 x 1 + . . . + 18.5 x 1 + 19.5 x 1) / 10 = 15 years.

is longer than 80 years.

Q. Do these same concepts also apply to utility property and to the net salvage analysis?

A. Yes. These same concepts are true for groups of utility property, in part because most property groups experience growth (both real and inflationary). For the net salvage analysis, the ages of retirements (as well as the historical inflation rate) determine the level of inflation in the historical analysis. The net salvage percentages resulting from the net salvage analysis are referred to as "realized net salvage," meaning that they represent the net salvage that has occurred to date.[27] The level of inflation incorporated into realized net salvage is a function of the age of historical retirements.

However, it is "future net salvage," the net salvage that will occur in the future for the assets currently in service, which both Mr. Dunkel and I agree needs to be estimated in the depreciation study.[28] The level of inflation that will occur over the life of the assets in the property group is a function of the probable life, not the average age of retirements. For this reason, it is incorrect for Mr. Dunkel to assert that the net salvage analysis projects the same inflation rate that has occurred in the past. By only focusing on the net salvage rate, Mr. Dunkel fails to recognize that the time period over which inflation occurs for the realized net salvage in the net salvage analyses is typically less than the time period over which inflation will occur for

[2727] Technically the net salvage analysis may include only a subset of the realized net salvage incurred to date, in the event net salvage data is not available for the full history of a utility company.

[28] Mr. Dunkel uses the term "future net salvage" throughout his testimony. For example, on page 46 he lists

future net salvage.

Q. Please provide an example to demonstrate that Mr. Dunkel's assertion is incorrect.

A. Consider as an example Account 364, Poles, Towers and Fixtures, which is an account for which Mr. Dunkel proposes a different net salvage estimate than mine and which he discusses in his testimony. The average service life estimate for this account is 55 years. The average probable life for the account is somewhat longer, and for plant in service as of December 31, 2016 is approximately 61 years. Both the average service life and the probable life are longer than the time period over which assets included in the net salvage analysis were in service (that is, the age of historical retirements).

The net salvage analysis for this account is based on historical data recorded for the period 1991 to 2016. However, the ages of retirements are only available from 1997 through 2016.[29] For this period, the average age of retirements in the historical analysis is about 19 years, which is considerably shorter than both the average service life and probable life for the account. Thus, the period of time over which inflation occurred for assets that have been historically retired, which is the 19-year average age of retirements, is considerably shorter than the probable life of assets in the account. To put this concept another way, the time period incorporated into the realized net salvage is, on average, 42 years shorter than the time period expected for

his "future net salvage recommendations."

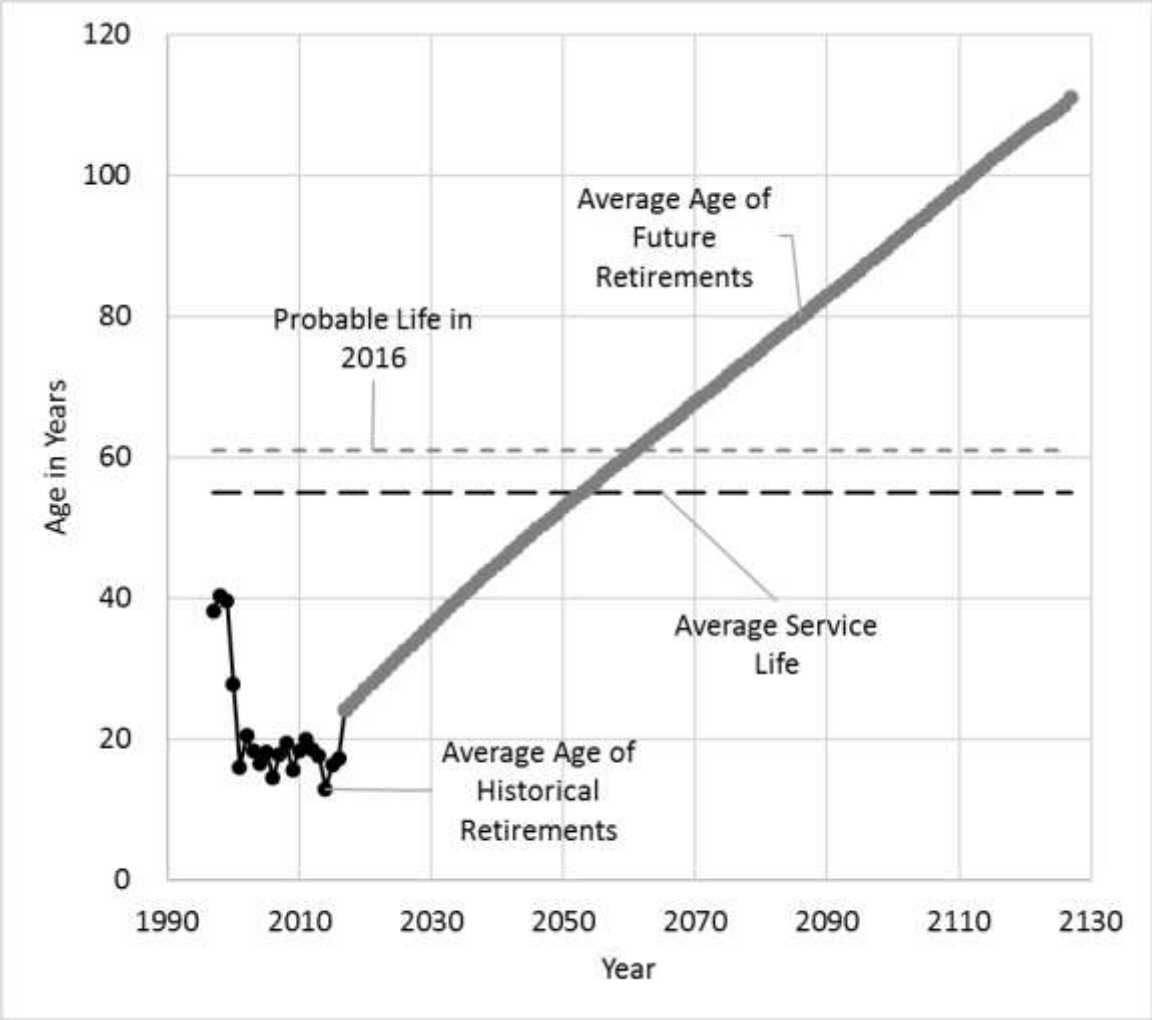
[29] For this reason, Mr. Dunkel's analysis of his adjusted data is only for the period 1997 through 2016.

future net salvage.

This concept is illustrated in the graph below, which shows the average age of retirements for this account by year for the years 1997 to 2016. The graph also shows, by year, the average age of retirements projected for assets currently in service based on the survivor curve estimate for this account. The average service life and probable life for the account are also included in the chart.[30] As the chart illustrates, while the average age of retirements is currently less than the average service life, over time the average age of retirements will increase and will become greater than the average service life. The overall average service life is obtained only once all the assets currently in service have been retired.

Figure 3: Average Age of Historical and Future Retirements for Account 364, Poles, Towers and Fixtures

[30] Mr. Dunkel has not challenged my survivor curve estimate for this account, and thus does not dispute the average service life or probable life for this account.



The average age of historical retirements (which is shown for the years 1997 to 2016 and represented by the black line and markers on the chart) provides the basis for the historical net salvage analysis. As the chart illustrates, in the future the average age of retirements will increase and become much higher than the historical age of retirements (as shown by the gray line and markers). Similarly, both the average service life for the account and the probable life as of December 31, 2016 are higher than the average age of historical retirements.

Q. How does the difference in time period between the average age of retirements and the probable life impact future net salvage estimates based on the traditional net salvage analysis?

A. As demonstrated above, the age of retirements for assets included in the analysis of realized net salvage (i.e., the traditional net salvage analysis) is much different from the age of future retirements. This difference in time period has an impact on the level of inflation that occurs and on the inflation rate inherent to a net salvage estimate based on the historical analysis. For example, if the inflation rate averaged 4 percent[31] over the 19-year average age of retirements, this does not mean that net salvage estimates would project 4 percent annual inflation for future net salvage (as Mr. Dunkel incorrectly assumes would be the case). Instead, a 4 percent inflation over the 19-year average age of retirements is approximately the same as 1.2 percent inflation over the 61-year probable life.[32] For this reason, Mr. Dunkel's contention that the traditional net salvage analysis that I have performed "assumes that the same high inflation rates will continue in the future"[33] is incorrect. Due to the difference in time period between the age of retirements and the probable life, to the extent inflation is projected when using the traditional net salvage analysis, it is typically at a lower rate than the historical inflation rate.

Q. How does Mr. Dunkel's analysis fail to incorporate the impact of the time

[31] A 4 percent inflation rate is actually quite a bit higher than the average inflation rate over the previous 19 years, which was 2.1 percent. A 2.1 percent inflation rate over 19 years is the same as a 0.6 percent inflation rate over the 61-year probable life for the account.
[32] 1.04^19≈1.012^61.
[33] Responsive Testimony of William Dunkel at 42:3-4.

period over which inflation occurs?

A. Mr. Dunkel's analysis focuses only on the inflation rates, and does not properly consider the difference in time periods between the average age of retirements in the statistical analysis and the probable life of assets currently in service. Consider the example discussed above for Account 364. For Mr. Dunkel's calculations, he first removes the historical inflation that has occurred over an average period of 19 years. However, when he adjusts the data to substitute his 2 percent inflation rate estimate in place of the experienced historical inflation, he only does so for an average time period of 19 years. He does not use the probable life of 61 years, as he would need to do to perform this type of analysis correctly. As a result, Mr. Dunkel effectively assumes that the average probable life of the assets in this account is only 19 years, which is much shorter than the average service life estimate of 55 years for this account and the average probable life of 61 years.

The result is that Mr. Dunkel's analysis produces results that are less negative than had he properly considered the time period over which inflation has and will occur for the Company's assets. Given this flaw in his analysis, Mr. Dunkel's results are unreliable and do not provide a reasonable basis for his net salvage estimates.

Q. You have explained the flaw in Mr. Dunkel's analysis regarding the difference in time periods between the age of historical retirements and the average service life and probable life. Would correcting this concept affect his calculations?

A. Yes. Mr. Dunkel cites Wolf and Fitch to support his analysis. As I will explain in Section III.B.iii, Wolf and Fitch clearly explain that "the average age of the annual

retirements and the average life of the group are important variables. Continuous property groups showing growth typically have large differences between the average age of the retirements and the average life of the group."[34] Thus, Mr. Dunkel's reading of Wolf and Fitch should have made clear that he would need to incorporate the difference in time periods between historical and future retirements into his analysis.

Even if Mr. Dunkel failed to understand this concept when he read Wolf and Fitch, I also explained this concept to Mr. Dunkel in a discovery response. In the response to Data Request AG-9-6 (which Mr. Dunkel included in his testimony as Exhibit WWD-22), I explain:

> The net salvage tables shown in part VIII of the Depreciation Study were prepared consistently for all accounts. Mr. Spanos did not adjust for the possibility that annual inflation may be different in the future from the past. The level of inflation is a function of the period of time as well as the inflation rate. Any adjustment for inflation would need to account for the fact that the historical period of time (i.e. the average age of retirements) is shorter than the average service life and probable life. Any attempt to adjust for historical inflation rates without properly considering the time period would be incorrect. Given the historical data, it is known that most of the retirements were for vintages subsequent to the 1970s/early 1980s which does not include the high inflation years stated in the question.[35]

I would expect that Mr. Dunkel has reviewed this response, since he included it as Exhibit WWD-22 to his testimony. However, when adjusting the historical

[34] *Depreciation Systems*, Frank Wolf and Chester Fitch, 1994, p. 267 (emphasis added).

[35] Response to AG 9-6 (emphasis added). This response was included in Mr. Dunkel's testimony as Exhibit WWD-22.

inflation rates, Mr. Dunkel did not consider the period of time over which historical inflation occurred, and as a result his analysis and adjustments fundamentally incorrect.

ii. Mr. Dunkel Has Not Used a Reasonable Long-Term Inflation Rate for His Analysis

Q. What does Mr. Dunkel recommend as a future inflation rate to use in his analysis?

A. Mr. Dunkel recommends that a "reasonable estimate of inflation is 2%."[36] His estimate is based on the inflation target established by the Federal Open Market Committee.[37]

Q. Do you agree that it is reasonable to substitute this estimate of inflation in the statistical analysis of historical data?

A. No. In addition to the flaws in Mr. Dunkel's analysis discussed in the previous section, I do not think it is appropriate to simply assume that inflation will occur at a 2 percent annual rate for the next 50 years or more. Mr. Dunkel has not provided a compelling reason to assume that his assumed inflation estimate will be more accurate than the Company's historical experience, nor has he provided a compelling reason to believe that future inflation will be significantly different than inflation that has occurred over previous long-term periods of time.

[36] Responsive Testimony of William Dunkel at 42:10.
[37] Responsive Testimony of William Dunkel at 42:13-15.

Q. Why do you state that the inflation forecast must be accurate for 50 years or more?

A. For the mass property accounts for which Mr. Dunkel proposes an adjustment to my net salvage estimates, the average service life estimates are greater than 50 years.[38] However, these are only the estimates of average service lives. Because each account will have a dispersion of lives,[39] many assets will live even longer than the average. For these reasons, for Mr. Dunkel's analysis to be valid, his forecast of future inflation must be accurate for at least the average service lives of the assets (and actually even longer because many assets will live longer than the average). This means that his forecast must be accurate for more than a half century.

Q. Why do you believe it is not appropriate to substitute Mr. Dunkel's inflation rate estimate for the Company's historical experience?

A. There are four primary reasons that I do not believe that Mr. Dunkel's inflation estimate is appropriate to use in lieu of the Company's historical data: (1) the inherent challenges in estimating inflation over the course of many decades; (2) that history does not support Mr. Dunkel's estimate to be reasonable; (3) that the Consumer Price Index (CPI) is not the best measure of cost increases for utility projects; and (4) that an inflation target should not be used as a proxy for future inflation.

[38] Mr. Dunkel also proposes a change for one production plant account.

[39] A "dispersion of lives" refers to the fact that many assets will have shorter lives than the average life, and many will have longer lives than the average life[40] The Livingston Survey, published by the Philadelphia Federal Reserve, can be found at: https://www.philadelphiafed.org/research-and-data/real-time-center/livingston-survey.

Q. What is the uncertainty with estimating future inflation over many decades?

A. An estimate of future inflation over a period of 50 years or more would require an understanding of economic conditions many decades in the future. Given the uncertainty the future brings, it would be impossible to accurately predict economic conditions a half century from now. I do not believe it is appropriate to simply assume that the Federal Open Market Committee's current inflation target will predict the inflation rate over a period of 50 years or more.

As further evidence of the inherent difficulty of long-term inflation forecasts, the Federal Reserve also compiles inflation forecasts from a survey of professional forecasters.[40] The longest-term such forecasts in the survey are for 10 years – a much shorter period of time than the time period for which Mr. Dunkel's estimate must be accurate for his analysis to have any validity. Given that the Federal Reserve does not publish inflation forecasts for a period longer than 10 years, it does not seem reasonable to me for Mr. Dunkel to simply assume that the Federal Open Market Committee's current inflation target will predict future inflation over a much longer period of time.

The historical record of these inflation forecasts provides further evidence for this concept. First, the median forecast of long-term inflation in recent years is higher than Mr. Dunkel's proposal. For example, the most recent median of 10-year inflation forecasts compiled by the Federal Reserve is 2.34 percent, which is higher

[40] The Livingston Survey, published by the Philadelphia Federal Reserve, can be found at: https://www.philadelphiafed.org/research-and-data/real-time-center/livingston-survey.

than Mr. Dunkel's inflation estimate.[41] Further, past forecasts show that inflation often ends up being different than expected. For example, inflation forecasts in the 1950s and 1960s were lower than actual inflation that occurred in the 1970s and 1980s. It is similarly possible that the inflation that occurs over the coming decades will be higher than Mr. Dunkel's estimate (and higher than the Federal Open Market Committee's target).

Q. Please explain how history does not support Mr. Dunkel's proposal.

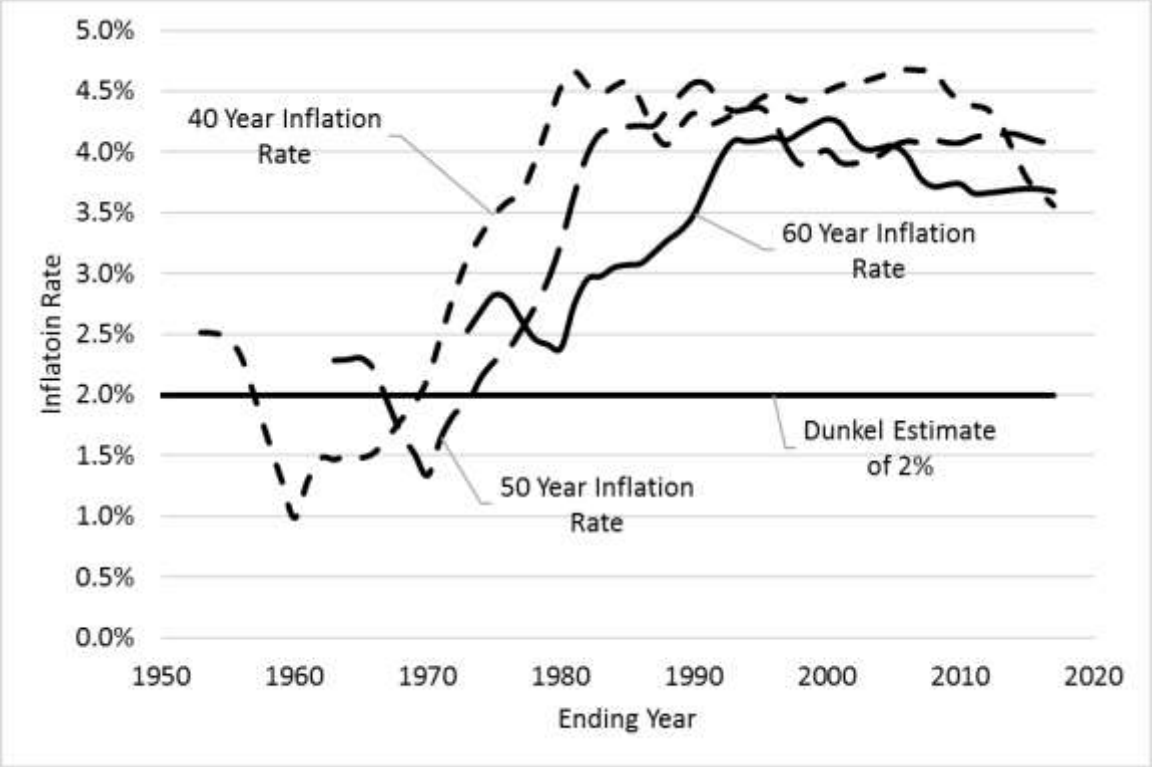
A. Again, for Mr. Dunkel's analyses to have any validity, his inflation estimate must be reasonable for a period of 50 years or more. In support of his estimate, Mr. Dunkel states that "the CPI has averaged 2.06 percent per year for at least the last 20 years."[42] However, this is too short a period of time to assess the reasonableness of a long-term forecast when determining net salvage for utility property that has average service lives that are much longer than 20 years.

A more complete analysis of the CPI data Mr. Dunkel used for his testimony is provided in Figure 4 below. The chart shows the annual inflation rate for every 40-, 50-, and 60-year period included in the CPI data (which begins in 1913). The chart also compares these inflation rates to Mr. Dunkel's inflation estimate of 2 percent. As the chart demonstrates, for every 60-year period available (shown as a solid black line), inflation has been higher than Mr. Dunkel's estimate of 2 percent. Further, for every 40-year period (shown as the smaller-dashed line) that began after 1930 and for

[41] See page 10 of the December 2017 release of the Livingston Survey, which can be found at: https://www.philadelphiafed.org/research-and-data/real-time-center/livingston-survey.
[42] Responsive Testimony of William Dunkel at 43:3-4.

every 50-year period (shown as the larger-dashed line) that began after 1924, the annual inflation rate has been higher than Mr. Dunkel's estimate.[43] The only 40- and 50-year periods for which inflation was lower than Mr. Dunkel's estimates include the Great Depression and the associated deflationary period.

Figure 4: Long-Term Inflation Rates Over 40-, 50- and 60-Year Periods



Thus, for Mr. Dunkel's long-term inflation forecast to be accurate, future inflation would need to be lower than almost every 40-, 50-, or 60-year period since 1913. Mr. Dunkel has not provided sufficient reason to expect that the long-term future will be significantly different from the long-term past, and accordingly he has not provided sufficient justifications for his decision to significantly alter the Company's historical

[43] The years shown in the graph are the ending years of the 40-, 50-, or 60-year period. Thus, for example, the 40-year period shown with an ending year of 1970 began in 1930.

net salvage data.

Q. Why is CPI not necessarily the best inflation index to use for Mr. Dunkel's analysis?

A. When estimating net salvage, the goal is to estimate what the cost of retiring the Company's assets (net of any gross salvage) will be at the time the assets are retired. To the extent removal costs change over time, they do not necessarily change at the rate of inflation. For example, utility labor costs may increase faster than general price inflation, and work requirements may add to the cost of retiring assets. For these reasons, the CPI index used by Mr. Dunkel, which measures general price changes throughout the economy for many different goods and services, is not necessarily the appropriate index to use for the analysis he has performed. Indeed, Wolf and Fitch (whom Mr. Dunkel relies on in support of his analysis) make a similar observation. The authors note that "[a]n important question centers on which inflation factor to use." After explaining CPI, Wolf and Fitch then state:

> It is desirable to obtain specialized indexes that reflect the inflation rates in special segments of the economy, and in fact firms specialize in estimating these factors. Different indexes may apply to gross salvage and cost of retiring and the appropriate index for gross salvage in one account will generally differ from that another account.[44]

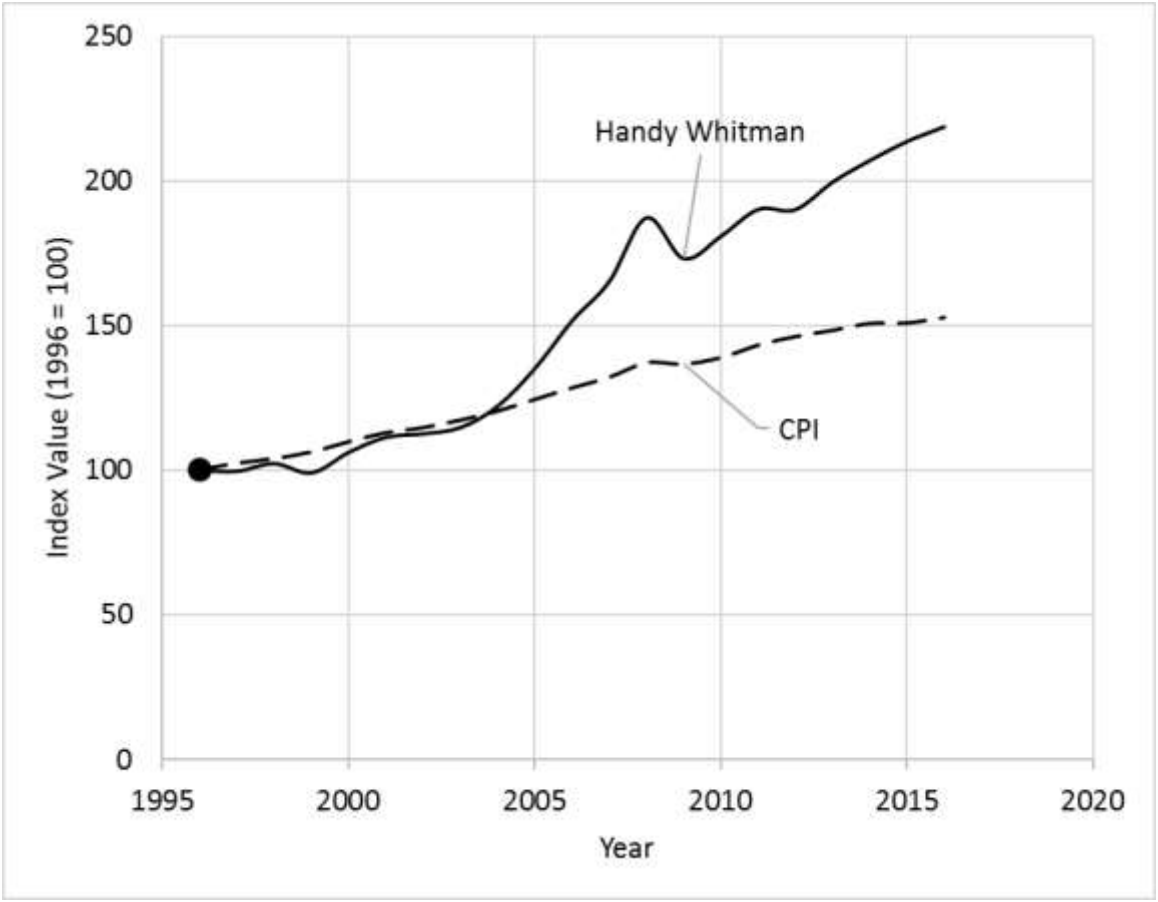
One such index is the Handy Whitman construction cost index, which has increased at a faster rate than CPI in recent years. For example, while Mr. Dunkel cites the average inflation rate based on CPI over the past 20 years,[45] the chart below

[44] *Depreciation Systems*, Frank Wolf and Chester Fitch, 1994, p. 61.
[45] Direct Testimony of William Dunkel at 43:3-4.

demonstrates that the Handy Whitman Index for Account 365, Overhead Conductors and Devices (shown as the solid black line in the chart), has increased at a faster pace over the same period.[46] Indeed, while the CPI has increased at an annual rate of somewhat more than 2 percent over this period of time, the Handy Whitman Index has increased at an annual rate of almost 4 percent. This provides further evidence that the 2 percent inflation estimate made by Mr. Dunkel is not appropriate for his analysis.

[46] The Handy Whitman Index for Distribution Overhead Conductors and Devices for the South Central region is used for this chart. 2016 is the most recent full year available for the Handy Whitman Index.

Figure 5: Comparison of CPI and Handy Whitman Index for Account 365, Overhead Conductors and Devices, 1996-2016



Q. What is the problem with using an inflation target as an estimate of long-term future inflation?

A. Many of the problems with Mr. Dunkel's approach of using an inflation target as a proxy for long-term inflation are similar to those discussed previously, such as the uncertainty in predicting long-term economic conditions and the question of whether the CPI is an appropriate cost index to use for Mr. Dunkel's analysis. Again, the median forecast compiled by the Federal Reserve is for a higher inflation rate than

the Federal Open Market Committee's target. However, another problem arises because the Federal Open Market Committee's goal is not just to hit its inflation target. Other economic factors also are considered by the Federal Open Market Committee, as noted in the Federal Open Market Committee statement provided by Mr. Dunkel:

> In setting monetary policy, the Committee seeks to mitigate deviations of inflation from its longer-run goal and deviations of employment from the Committee's assessments of its maximum level. These objectives are generally complementary. However, under circumstances in which the Committee judges that the objectives are not complementary, it follows a balanced approach in promoting them, taking into account the magnitude of the deviations and the potentially different time horizons over which employment and inflation are projected to return to levels judged consistent with its mandate.[47]

Thus, this statement acknowledges that the 2 percent inflation target is a target, not the actual inflation rate that will occur over a long-term period of time, and also affirms that the inflation rate is not the only economic goal of the Federal Open Market Committee.

Q. Based on these considerations, are Mr. Dunkel's adjustments to the historical data reasonable?

A. No. As I have explained in the previous section, there are significant flaws that discredit Mr. Dunkel's analysis. However, even if Mr. Dunkel had performed his analysis correctly, there is not a sufficient basis to assume, as Mr. Dunkel does, that inflation will average 2 percent per year over the next 50 years or more. Doing so

[47] Exhibit WWD-23.

assumes that the future will be very different from almost any long-term historical period. Instead, the most reasonable basis for the Company's net salvage estimates is the analysis of the unadjusted historical data that I have used in the Depreciation Study.

iii. Mr. Dunkel Does Not Follow the Instructions in Wolf and Fitch

Q. What authority does Mr. Dunkel rely on in support of the analysis he has performed?

A. Mr. Dunkel cites Wolf and Fitch as an authority that supports his analysis. He states that Wolf and Fitch "discusses a method that first converts 'the observed dollars to constant dollars' which removes the high historic inflation rates, and then use a more reasonable estimate of the inflation."[48] There are two significant problems with Mr. Dunkel's assertion that Wolf and Fitch supports his analysis. First, this is not an accurate characterization of Wolf and Fitch, who do not state anywhere in the text that the intent of the analysis to which Mr. Dunkel cites is to "use a more reasonable estimate of the inflation." Instead, a more complete reading of Wolf and Fitch makes clear that the primary intent of the net salvage models presented by the authors is to account for the concepts I discussed in Section III.B.i, namely, that the difference in time periods between the age of historical retirements and the average age of future retirements impacts the traditional net salvage analysis.

[48] Responsive Testimony of William Dunkel at 43:8-9.

The second problem is that Mr. Dunkel's analysis is not what is actually presented in Wolf and Fitch. Instead, Mr. Dunkel's analysis appears to be his own creation and is fundamentally flawed. If he had followed the instructions in the text, his analysis would have produced very different results.

Q. What is the context of the Wolf and Fitch chapter cited by Mr. Dunkel?

A. In support of his analysis, Mr. Dunkel cites Chapter 14 of Wolf and Fitch, which is titled "Salvage Analysis and Forecasting."[49] This chapter is focused on detailed mathematical models that can be used to estimate future net salvage. As the first sentence of the chapter explains:

> This chapter discusses the analysis of aged salvage data and illustrates the use of a mathematical model to help estimate future salvage.[50]

The models described in the text are complex and not only require aged net salvage data, but also require a detailed analysis of the mortality characteristics of the property group studied and the factors that have an impact on realized net salvage and future net salvage. However, the intent of these models is not to use a different estimate of inflation, as Mr. Dunkel asserts, but instead to account for the fact that realized net salvage is not always representative of average and future net salvage (due primarily to the lower age of historical retirements than the age of future retirements).[51] In concluding the chapter, Wolf and Fitch summarize this concept as

[49] Wolf and Fitch use the term "salvage" to refer to "net salvage," i.e., gross salvage net of cost of removal.
[50] *Depreciation Systems*, Frank Wolf and Chester Fitch, 1994, p. 260.
[51] While these models can accommodate changes to any variable (such as the inflation rate or the time period), the full texts of Wolf and Fitch make clear that their focus is on the ages of past and future retirements as the most important variables.

follows:

> Salvage ratios are a function of inflation. For long-lived property, the salvage associated with the longest lived property is affected most. However, this may not be reflected in the data for some time. A mathematical model that includes the effect of salvage can be a valuable forecasting tool. Salvage data by age contains information helpful for constructing and verifying a mathematical model.[52]

As this passage makes clear, the purpose of the mathematical model is to incorporate the impact of inflation on future net salvage for long-lived property that is not reflected in the historical data due to the age of historical retirements. Mr. Dunkel's analysis focuses only on changing the inflation rate, without accounting for the impact of the age of retirements on realized net salvage as compared to future net salvage. Thus, not only is Mr. Dunkel's analysis flawed, but it is not supported by Wolf and Fitch.

Q. Are the models described in Wolf and Fitch widely used for net salvage analysis in utility rate proceedings?

A. No. Although these models can be useful tools for estimating future net salvage, they are not widely used because of their complexity and because the data required to properly use the models is not normally available. As the opening sentence of Chapter 14 of Wolf and Fitch makes clear, the models described by Wolf and Fitch require "aged salvage data," meaning that for every cost of removal and gross salvage transaction analyzed, the age of retirements is known. Aged salvage data is typically not available for a depreciation study, a fact which is observed by Wolf and Fitch:

> Salvage analysis starts with an examination of the data

[52] *Depreciation Systems*, Frank Wolf and Chester Fitch, 1994, p. 267.

> reflecting total annual costs. Often these are the only data available.[53]

Wolf and Fitch explain the type of net salvage analysis that should be used to analyze data reflecting total annual costs, which is the analysis I have used in the Depreciation Study. I also note that Wolf and Fitch provide an example (Table 14.3 in the text), which is the same analysis I have performed for the Depreciation Study.[54]

Q. Does the Company have aged net salvage data?

A. No, and in part for this reason the traditional net salvage analysis I have used, which is supported by both NARUC and Wolf and Fitch, is most appropriate for OG&E. Aged net salvage data not only requires the age of each retirement to be known, but also that each cost of removal and gross salvage transaction can be associated with each retirement by age. It is rare for this type of data to be available due to the nature of real-world utility operations and the record-keeping that would be required to maintain aged net salvage data. Consider, as an example, a project to reconductor overhead distribution lines on a city block. The work involved in such a project would often result in the retirement not only of the overhead wire, but also poles (which may be replaced either because larger poles are needed or because some poles are deteriorated) and other assets such as line transformers. Because the conductor, poles, and transformers may not have been installed at the same time, and because these assets are associated with different plant accounts, it would be very difficult (if not impossible) to track and associate costs for each removal activity to the age of

[53] *Depreciation Systems*, Frank Wolf and Chester Fitch, 1994, p. 261.
[54] *Depreciation Systems*, Frank Wolf and Chester Fitch, 1994, p. 261, which references Table 14.3 on page 271 of the same text.

each asset being retired. For this reason, aged net salvage data is rarely available for a depreciation study. This is one reason why the method of analysis I have used in the Depreciation Study, which Wolf and Fitch explains is the analysis that is used if aged net salvage data is not available, is the most widely used method of analysis for depreciation studies.

Q. What does Wolf and Fitch advise should be considered if aged net salvage data is not available, as is the case for the Company?

A. Wolf and Fitch make clear that the analyst must consider the age of historical retirements, and that these ages are typically less than the average service life (and thus also shorter than the probable life). This underscores my point that, contrary to Mr. Dunkel's assertion, the primary intent of the models described by Wolf and Fitch is to account for the difference in time periods in the historical net salvage analysis and not to change the historical inflation rate. Specifically, Wolf and Fitch state:

> Often the only available data are the total annual gross salvage and cost of retiring. An example of this type of data is shown in Table 14.3. When analyzing unaged salvage, remember that realized salvage depends on the age of the retirements. Realized salvage starts at zero and does not reach the average until the final unit in the group is retired. Thus, the average age of the annual retirements and the average life of the group are important variables. Continuous property groups showing growth typically have large differences between the average age of the retirements and the average life of the group.[55]

Q. Had Mr. Dunkel more accurately followed the instructions in Wolf and Fitch, would his results be different from what he has proposed?

[55] *Depreciation Systems*, Frank Wolf and Chester Fitch, 1994, p. 267 (emphasis added).

A. Yes. To demonstrate this point, I will provide an example for Account 364, Poles, Towers and Fixtures. This is the same account that Mr. Dunkel discusses in his testimony. As noted previously, the Company does not have aged net salvage data. This adds uncertainty to the use of this type of mathematical model, and, as Wolf and Fitch note, also means that the analyst cannot verify that the model is correct.[56] For these reasons, I present the results of this mathematical model for illustrative purposes to demonstrate the problems with Mr. Dunkel's analysis and to demonstrate that, had he faithfully followed the instructions in Wolf and Fitch, his analysis would have produced very different results. However, I do not intend to have this analysis replace the results of my Depreciation Study, which, again, are based on the appropriate net salvage methodology for the data available.

That said, Mr. Dunkel cites page 265 of Wolf and Fitch in his assertion that he has used the analysis set forth in this text. When using the analysis described on that page of Wolf and Fitch, one would, as a first step, convert the net salvage data to constant dollars (meaning that net salvage and retirements are expressed at the same price level). In his work papers, Mr. Dunkel has done a constant dollar calculation for this account in Exhibit WWD-24. The result of his calculation is a total net salvage amount for the period 1997-2016 of $14,463,365.[57] Dividing this amount by the total recorded 1997-2016 retirement amount of $56,649,217 results in an average realized net salvage percentage of negative 26 percent when expressed in constant

[56] *Depreciation Systems*, Frank Wolf and Chester Fitch, 1994, p. 266.

dollars. I note that this amount includes the reimbursements, so, if anything, this constant dollar net salvage percentage is too low.

Based on this analysis, one might conclude that the analysis results in an average realized net salvage, expressed in constant dollars and including reimbursements, of negative 25 percent. However, this is only the net salvage for an asset retired at age 0. Most assets currently in service are older than an age of zero, and will be in service for many more years. Accordingly, Wolf and Fitch explain that a table of average and future net salvage by age must be constructed, which can be used to develop an average net salvage and future net salvage for the entire group. Wolf and Fitch present an example of the type of table that would be constructed when using the Broad Group Model used in the depreciation study, which is presented in Table 6.11 on page 163 of the text. Mr. Dunkel has not performed this step of the analysis.

Q. What would be the result of constructing a table like Table 6.11 in Wolf and Fitch for Account 364, Poles, Towers and Fixtures?

A. Using a negative 25 percent net salvage estimate that would occur for assets at age zero, I have constructed a similar table as Wolf and Fitch's Table 6.11 for Account 364, Poles, Towers and Fixtures. The result is provided as Exhibit JJS-1R, which uses Mr. Dunkel's estimate of 2 percent as an annual inflation rate.[58] While I

[57] This amount in Mr. Dunkel's work papers is the resulting net salvage once adjusted by the CPI to the estimated year each retired asset was originally installed. As a result, this amount is in constant dollars when compared to the recorded retirements.

[58] Using a 2 percent inflation rate for all ages and all vintages is an additional assumption when using this model. Because many assets in the account are old (for example, those installed in the 1960s and 1970s), they have already experienced inflation at a higher rate than 2 percent. Using a 2 percent inflation rate for all ages for all vintages is, as a result, likely too low for many vintages and effectively assumes that future inflation will be less than 2 percent. However, the additional analyses required to correct for this discrepancy would even

disagree with Mr. Dunkel's estimate of future inflation for the reasons discussed in the previous section, the use of the same inflation rate for this calculation helps to illustrate that he has failed to properly perform the analysis set forth in Wolf and Fitch.

The result of the calculations in Exhibit JJS-1R is an average net salvage of negative 84 percent, which is more negative than Mr. Dunkel's estimate of negative 45 percent. It is also more negative to my net salvage estimate of negative 65 percent. Again, this analysis was performed with an inflation rate of 2 percent, and included the reimbursements. Properly excluding the reimbursements would result in an even more negative net salvage estimate. However, even when including the reimbursements, had Mr. Dunkel actually followed the instructions of Wolf and Fitch, his analysis would have supported my estimate and not his estimate.

Again, this is true even with Mr. Dunkel's estimate of inflation of 2 percent, which I have explained is not a reasonable estimate for the inflation rate over the next half century. A change to the inflation rate used in the calculations would produce different results. I have illustrated this concept in the Table 1 below, which also shows the results of using a 2.5 percent inflation rate, a 3 percent inflation rate, and a 4 percent inflation rate. The detailed calculations based on Table 6.11 of Wolf and Fitch are provided in Exhibits JJS-2R, JJS-3R and JJS-4R. Table 1 also shows, for comparison, the results of Mr. Dunkel's flawed analysis.

further complicate the model.

Table 1: Comparison of Net Salvage Estimates to Analysis Described in Wolf and Fitch

Company Estimate	AG Estimate	AG Analysis	Corrected Wolf and Fitch Analysis			
			2% Inflation Rate	2.5% Inflation Rate	3% Inflation Rate	4% Inflation Rate
-65%	-45%	-37%	-84%	-117%	-165%	-337%

These analyses help to illustrate a couple of important points. First, for each inflation rate scenario, the result is more negative net salvage than the results of Mr. Dunkel's analysis. The results are also more negative than both my estimate and Mr. Dunkel's estimate. Thus, had Mr. Dunkel properly followed the instructions in Wolf and Fitch, his analysis would have produced very different results, and his estimate would have been quite different (and likely more negative than my estimate). This is true even if the reimbursements are included.

The second point is that the results of using a detailed model such as those described in Wolf and Fitch can be sensitive to the estimated inflation rate. As I have explained, Mr. Dunkel's inflation rate estimate is inappropriate, and as Table 1 above demonstrates, changes to the inflation rate can produce significant changes to the results (and would, in fact, support net salvage estimates that are much more negative than what I have proposed).

Finally, due to factors such as the limitations of the availability of aged net

salvage data, the traditional net salvage analysis I have used is most appropriate for the Company's Depreciation Study. While there can be value to the mathematical models described by Wolf and Fitch, the lack of aged net salvage data and the uncertainty in inflation estimates means that the results of using these models in this proceeding are, in my professional judgment, less reliable and less appropriate than using the traditional net salvage analysis that I have employed (and which is also supported by Wolf and Fitch).

Q. For his analysis, did Mr. Dunkel perform calculations similar to Table 6.11 in Wolf and Fitch?

A. No. Instead, Mr. Dunkel's calculations only use the age of historical retirements and, as a result, fail to calculate an average or future net salvage ratio as described in Wolf and Fitch. In support of his calculations, Mr. Dunkel cites page 265 of Wolf and Fitch, which explains that "[d]epreciation calculations require an estimate of the average salvage ratio (ASR) and future salvage ratio (FSR) for each vintage," and further explains that when the Broad Group model is used (as is the case in the Depreciation Study), then "the same salvage schedule is applied to each vintage." Wolf and Fitch then provide Table 6.11 (upon which the calculations in Table 1 above were based) as an example of how the average and future net salvage should be calculated. Given these instructions in Wolf and Fitch, Mr. Dunkel should have performed calculations similar to Table 6.11 in Wolf and Fitch, which I have created for Schedules JJS-1R, JJS-2R, JJS-3R, and JJS-4R (and for which the average salvage ratios are summarized in Table 1 above). He did not do so.

In data request OGE-AG-3-4, Mr. Dunkel was asked to explain why he did not perform the actual calculations described in Wolf and Fitch, given that he cites page 265 of this text to provide support for his approach. Mr. Dunkel's response does not provide a reasonable basis for ignoring this step in the analysis and is contradicted by statements in his testimony. Specifically, Mr. Dunkel's response to Data Request OGE-AG-3-4 states the following:

> Mr. Dunkel had no reason to duplicate tables 6.11 or 14.6 because they were not addressing the issues that Mr. Dunkel was addressing.[59]

This is simply incorrect. Mr. Dunkel claims to be using a method described on page 265 of Wolf and Fitch, which he specifically cites to attempt to portray his method as being supported by Wolf and Fitch.[60] Had he actually followed the instructions on this page, he would have constructed tables similar to either Table 6.11 or Table 14.6. However, when pressed upon this in discovery, Mr. Dunkel now claims to be doing something different. It should, therefore, be quite clear that Mr. Dunkel's approach is not supported by Wolf and Fitch.

Q. Given the context of Wolf and Fitch discussed above, has Mr. Dunkel followed the instructions and advice of this text?

A. No. Not only has Mr. Dunkel based his estimates and analyses on an inappropriate methodology that is not consistent with the instructions in the text he uses as an

[59] See the AG's response to OG&E.

[60] See lines 8-10 on page 43 of Mr. Dunkel's testimony. He cites page 265 of Wolf and Fitch to support his statement that a method in Wolf and Fitch "then uses a more reasonable estimate of the inflation." This is incorrect. Page 265 of Wolf and Fitch explains the use of methods to estimate average and future net salvage using calculations set forth in either Table 14.6 or 6.11 of this text. Mr. Dunkel has made clear that he did not perform these calculations.

authority, but he has failed to follow Wolf and Fitch's instructions to consider the average age of annual retirements as compared to the average life of the group. As I have described previously, his analysis is flawed on the merits, and should not be considered in estimating future net salvage. This is one reason that, to my knowledge, Mr. Dunkel's proposed net salvage methodology in this proceeding has not been accepted by any regulatory commission.

iv. Mr. Dunkel's Net Salvage Methodology Has Been Previously Rejected

Q. Is the method of analysis proposed by Mr. Dunkel widely accepted in the industry?

A. No. In fact, I am not familiar with many cases in which his proposed method of analysis has even been proposed, much less accepted. Although through the years Mr. Dunkel has proposed a variety of different unorthodox approaches to determining net salvage (which have gained only limited acceptance), I am familiar with only one case in which Mr. Dunkel's firm proposed the same (or similar) analysis to what Mr. Dunkel has proposed in the instant case. That case was a 2007 rate case in Missouri for AmerenUE (now AmerenMO).[61] The Missouri Public Service Commission (MPSC) rejected his proposal.

As the MPSC explained, Mr. Dunkel recommended that:

> the Commission adjust the accrual method of calculating future net salvage by substituting a projection of future inflation for the historic inflation actually experienced when

[61] MPSC Case No. ER-2007-0002.

conducting an analysis of net salvage.[62]

The MPSC rejected Mr. Dunkel's proposal, explaining:

> The proposal to substitute projections of future inflation for historic rates of inflation is flawed by an overstatement of the average age of historical retirements used in the formulas for substituting projected future inflation for historic rates of inflation. As explained by AmerenUE's witness, William Stout, MIEC [Missouri Industrial Energy Consumers] and Public Counsel would use average service life as the average age of future retirements. The average age of future retirements is not the average service life, but rather is the average probable life. The average probable life is the same as average service life when an asset is first placed in service, but as time passes the average probable life continues to increase beyond the average service life. This is the same effect experienced in human life expectancy. At birth, a child may have a life expectancy of 70 years, but a 69 year old may still have a life expectancy of more than one year. The use of probable life would result in the inclusion of more future inflation than was recognized by MIEC and Public Counsel and would invalidate their proposed adjustments.
>
> Even more fundamentally, MIEC and Public Counsel have failed to demonstrate any reason to believe their estimates of future inflation are a more reliable predictor of future inflation than the past history used by Staff and AmerenUE in their calculations. Expert predictions of future inflation can be little more than guesswork. It is impossible to accurately predict what inflation might occur 30 or 40 years in the future. No doubt if an esteemed panel of experts had been polled in 1960 they never would have predicted the severe inflation of the 1970s and 1980s. Similarly, today's experts cannot possibly foresee whatever inflation may occur in 2023. The Commission finds past history to be a better predictor of future inflation for ratemaking purposes.[63]

Q. Has Mr. Dunkel provided any other cases in which his proposed method of net salvage analysis was accepted by a regulatory commission?

[62] Report and Order, MPSC Case No. ER-2007-0002, Issued May 22, 2007, p. 90.
[63] Report and Order, MPSC Case No. ER-2007-0002, Issued May 22, 2007, pp. 92-93.

A. No. Mr. Dunkel did not provide any such examples in his testimony. In data request OGE-AG-3-5, he was asked if he was aware of:

> any other utility cases (in any jurisdiction) in which Mr. Dunkel or another witness made a proposal to use the same net salvage analysis Mr. Dunkel has proposed in the instant case (i.e., using the same net salvage analysis shown in Exhibit WWD-24, which "removes the high historic inflation rates, and then use[s] a more reasonable estimate of the inflation").[64]

In his response, Mr. Dunkel provided citations to five cases. However, in none of these has his specific method been accepted by a regulatory commission. Two of the cases are still pending, and for the only one in which the traditional net salvage method was not adopted (a Pepco case in the District of Columbia), a completely different present value method was proposed. Further, in only one of the cases cited did a witness even use the same method as Mr. Dunkel as the primary support for their proposals in direct testimony. In the PSO, Indiana-American Water Company and NSTAR and WMECO cases provided by Mr. Dunkel, his proposals were based on a different method that was similar to expensing net salvage after it occurs.[65] While he may have had some discussion of Wolf and Fitch in these cases, his proposals were not based on the same method that he has proposed in the instant case.

Further, Mr. Dunkel's proposals have not been accepted in these cases. While the Indiana-American Water Company case is still pending, in the other two cases Mr.

[64] See the AG's response.

[65] In these cases, Mr. Dunkel did provide later testimony that discussed a constant dollar approach he alleged was supported by Wolf and Fitch. However, his initial proposals were not based on the method he

Dunkel's net salvage proposals were not accepted. I will discuss the PSO case later in this section. However, Mr. Dunkel does not even appear to be aware that, upon reconsideration, his proposal in the NSTAR and WMECO case was rejected by the Massachusetts Department of Public Utilities. Instead, my net salvage proposals were adopted in that case:

> [t]he Department is not prepared to deviate from a recognized and accepted approach to deriving salvage ratios in the absence of an appropriately supported alternative. In this case, upon reconsideration, we are not persuaded that the Attorney General's [Mr. Dunkel's] alternative approach is sufficiently reliable to warrant a departure from the approach used by Eversource. Moreover, as noted above, we find that the overall depreciation rates proposed by Eversource [Mr. Spanos] are appropriate and not excessive.[66]

In summary, based on Mr. Dunkel's testimony and his response to OGE-AG-3-5, the only rational conclusion is that Mr. Dunkel is not actually aware of a single instance in which a regulatory commission has adopted the specific methodology that he has used in the instant case. At a minimum, Mr. Dunkel has provided no support that his proposal has ever been adopted in any regulatory jurisdiction. In contrast, the traditional method I have used is widely accepted and is the predominant method used in the industry.

Q. Mr. Dunkel also claims that it is a common practice "to recommend a future net salvage ratio that is significantly lower than shown by the historic net salvage data."[67] Please address this claim.

A. Mr. Dunkel provides little support for this claim, other than to cite to a transcript

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proposes in the instant case.

[66] MA DPU Docket 17-05-F, Order on Eversource's Motion for Reconsideration and Motion for Leave to File a Response, Issued May 11, 2018, p. 18

from a proceeding in Maine. He provides no citations to commission orders or to authoritative depreciation textbooks to support this. Further, while Mr. Dunkel quotes from "a depreciation witness for a utility" as his only support for this claim, he does not provide the context of this claim or provide any evidence that this is a widespread practice and not based on something specific to a certain account. Given Mr. Dunkel's previous history of quoting sources out of context, I would give little credence to Mr. Dunkel's citations of this transcript. Nevertheless, his assertion that using a future net salvage ratio "that is between one-third to one-half of the ratio shown by the historic net salvage ratio" is by no means a common or widely supported practice, even if a depreciation witness stated he had done so in one particular instance. I am not familiar with any depreciation textbook that would support such an approach, nor is it a common practice for depreciation professionals I am familiar with. While there may be specific circumstances in a depreciation study that result in net salvage estimates being different from the indications in the historical data (for example, if the future is expected to be different from the past), it is not a common practice to do so for no apparent reason. Mr. Dunkel's attempt to present a statement from one isolated transcript as being indicative of common industry practices has no basis and should be ignored.

Q. Are you familiar with any rate cases in which a regulatory commission held that the inflation that will occur over an assets' full service life should be considered when determining future net salvage costs?

[67] Responsive Testimony of William Dunkel at 47:5-6.

A. Yes. In addition to the Michigan decision noted above, the Federal Energy Regulatory Commission has also held that future net salvage costs should be stated at the future cost level. I will discuss both of these decisions in more detail in Section V.

Q. You indicated that Mr. Dunkel previously testified in a cause for PSO in Oklahoma. Did Mr. Dunkel make the same net salvage proposal in that case as he has done here?

A. No. Mr. Dunkel instead made a different unorthodox proposal in that case, in which he determined net salvage based on a method that would effectively expense net salvage after it is incurred.[68] The Commission did not adopt Mr. Dunkel's proposed net salvage method in that cause.[69] Because his previous method was not adopted in PSO's cause, Mr. Dunkel has developed a different approach for the instant cause. Neither of these proposals are consistent practices with the only apparent focus of reducing depreciation expense.

IV. LIFE SPANS FOR PRODUCTION PLANT

Q. Have any parties disagreed with the Life Spans for Production Plant?

A. Yes. AG witness Dunkel and OIEC witness Garrett have made adjustments to the life spans of some of the generating units. PUD and FEA have not proposed any changes

[68] For example, Mr. Dunkel testified that his method in the PSO cause was the same as the "Pennsylvania method" (see page sd-91, line 16 through sd-92, line 2 of the November 3, 2017 transcript in Cause No. PUD 201700151). For the Pennsylvania method, net salvage is recovered as a normalized expense after it is incurred.

[69] In Order No. 672864 of Cause No. PUD 201700115, the Commission states: "The Commission does not adopt paragraph 108 of the ALJ Report with respect to net salvage, and would adopt the position of PUD witness Carolyn Weber."

to the life span estimates.

Q. What are Mr. Dunkel's and Mr. Garrett's bases for changing the life span estimates?

A. Both recommend changes to the life span estimates based on the dates included in the previous 2014 and 2015 Integrated Resource Plans (IRPs). However, I am using the most up to date information received from the Company to reflect the retirement dates that will be reflected in the new 2018 IRP that the Company will be releasing this summer. Accordingly, there is no basis to change the life span dates to the recommendations of Mr. Dunkel and Mr. Garrett.

V. PRODUCTION PLANT NET SALVAGE

Q. What will you discuss in this section of your testimony?

A. In this section I will discuss the component of net salvage for production plant related to the decommissioning of the Company's power plants, also referred to as terminal or final net salvage.

Q. What is terminal net salvage?

A. Certain types of depreciable property are referred to as "life span" property, which means that a large percentage of the property at a facility is expected to be retired concurrently. Power plants are textbook examples of life span property. While many of the components of a plant will be replaced throughout the plant's life, upon the retirement of the entire plant all remaining assets will be retired concurrently. The retirements at the end of the life of the plant are referred to as "terminal" or "final" retirements, while the retirements that occur before this final retirement are referred

to as "interim" retirements. Similarly, net salvage that occurs at the end of the life of the plant is "terminal" or "final" net salvage and salvage that occurs with interim retirements is "interim" net salvage. For power plants, terminal net salvage is normally related to decommissioning costs for the facility.

Q. Do all parties agree that terminal net salvage should be included in depreciation?

A. Yes. All parties appear to agree with the concept that terminal net salvage should be included in depreciation. However, the AG, OIEC and FEA have proposed various adjustments to the terminal net salvage estimates used in my study, which are based on the decommissioning study performed by OG&E witness Jeffrey Kopp. These fall into two broad categories. The first is adjustments to the decommissioning estimates which form the basis of the terminal net salvage estimates. OG&E witness Kopp will address these adjustments, including the need for contingency to be included in the decommissioning estimates. The second type of adjustment is that the AG, OIEC and FEA disagree with the process I have used to escalate the decommissioning costs to the time of retirement in order to include the future net salvage cost in my depreciation recommendations. My testimony will focus on this terminal net salvage issue.

Q. Why must the terminal net salvage cost be the future cost, not the current cost to decommission these facilities?

A. In order to equitably recover the full costs of the Company's assets, including net salvage, net salvage must be based on future costs because decommissioning is going

to occur in the future. Accordingly, the decommissioning costs used in the depreciation calculations for terminal net salvage must be estimates of the future cost at the time of decommissioning. For this reason, if decommissioning estimates are developed using the cost to decommission a plant today, then these costs should be escalated to the time period in which they are expected to be incurred.

Q. What do the AG, OIEC and FEA propose with regard to the escalation of decommissioning costs?

A. The AG and OIEC propose to not include any escalation. FEA proposes to include escalation, but does not propose to use the straight-line method to recover the net salvage costs. Rather, despite Mr. Andrews statement that he used the straight-line method for his recommendations,[70] Mr. Andrews uses a deferred sinking fund method for terminal net salvage.[71]

Q. Please provide an example to demonstrate how the other parties' proposals for decommissioning costs will not properly allocate the company's costs over the service lives of their generating facilities?

A. I will provide an example to demonstrate the problems with the AG and OIEC's proposals. The decommissioning study prepared by Mr. Kopp uses costs at today's price level. However, many of the Company's plants will not be retired for many years. The net salvage costs need to be escalated so that the correct amounts are allocated over the lives of the plants.

[70] Responsive Testimony Brian Andrews at 8:3-4.
[71] Responsive Testimony Brian Andrews at 27:20-22.

Consider the following example. Assume a Company has a power plant that cost $1,000,000 to construct, will be in service for 40 years, and the net salvage is negative 10 percent. The negative 10 percent represents the cost at retirement, and so in year 40 it will cost $100,000 to decommission the plant. Additionally, assume that inflation occurs at a rate of 2.5%. Using the straight-line method, the resulting depreciation accrual would be $27,500[72] and a depreciation rate of 2.75%[73]. This is the proper amount needed to recover the full $1,100,000 over the 40-year life of the power plant.

However, the AG's and OIEC's recommendations for decommissioning would not recover the plant's original cost plus the cost to decommission it upon retirement. Consider the calculation of depreciation at year 1, when the asset is placed in service. The decommissioning cost of $100,000 stated in year 1 dollars is only $37,243.[74] This is the amount that the other parties recommend should be included in depreciation expense for the Company's power plants, and their methodology would produce only $25,931[75] in depreciation expense and a depreciation rate of 2.59%[76]. Using such a method will not recover the full service value (the plant's original cost plus decommissioning costs) that the company should be allowed to recover through depreciation. Instead, the Company will only recover $1,037,243 through depreciation expense and will recover less than 40 percent of the

[72] (1,000,000-(-100,000))/40=27,500
[73] $27,500/1,000,000=2.75%
[74] $100,000/1.025^40
[75] (1,000,000-(-37,243))/40=25,931
[76] $25,931/1,000,000=2.59%

actual net salvage costs for the plant. This represents $62,757 less than the full service value of the plant that the Company is entitled to recover.

I note here that this example is a hypothetical example based on a calculation at a single point in time. However, for a depreciation methodology to properly recover the costs of a Company's assets (including net salvage), the depreciation rates should recover the full cost if constructed properly and if the assumptions at the time of the depreciation study are accurate. As this example demonstrates, the other parties' proposals will not meet this objective.

Q. Is recovering the future cost of net salvage consistent with the Uniform System of Accounts?

A. Yes. The objective of depreciation is to allocate, in a systematic and rational manner, the full cost of an asset (original cost less net salvage) over its service life. The Uniform System of Accounts (USOA) requires this in General Instruction 22-A:

> *Method*. Utilities must use a method of depreciation that allocates in a systematic and rational manner the service value[77] of depreciable property over the service life of the property.

Definition 37 of the Uniform System of Accounts defines the term "service value" used in the above instruction"

> Service value means the difference between original cost and net salvage value of electric plant.

The USOA defines net salvage as follows:

> 19. *Net salvage value* means the salvage value of property retired less the cost of removal.

Cost of removal is defined as:

[77] The USofA defines service value as the original cost less net salvage

> 10. *Cost of removal* means the cost of demolishing, dismantling, tearing down or otherwise removing electric plant, including the cost of transportation and handling incidental thereto. It does not include the cost of removal activities associated with asset retirement obligations that are capitalized as part of the tangible long-lived assets that give rise to the obligation. (See General Instruction 25).

Finally, cost is defined as (emphasis added):

> 9. *Cost* means the amount of money actually paid for property or services. When the consideration given is other than cash in a purchase and sale transaction, as distinguished from a transaction involving the issuance of common stock in a merger or a pooling of interest, the value of such consideration shall be determined on a cash basis.

Read together, it should be clear from these definitions that the USOA specifies that cost of removal, which as part of net salvage must be recovered through depreciation expense, is the actual amount that is paid at the time of the transaction. Because net salvage will occur in the future, an estimate of the future cost (not the current cost) must be included in depreciation rates. That is, the USOA definitions mean that the future cost is the cost that must be recovered as net salvage through depreciation. It is not the current cost, as the AG and OIEC propose.

Q. Has FERC addressed that the future cost, including escalation, must be included in net salvage for production plant?

A. Yes. As noted above, the USOA requires that net salvage be included in depreciation and that the cost to recover is the cost that will be incurred (i.e., the future cost). FERC has affirmed this interpretation of the USOA in a 2013 opinion. In this 2013 FERC opinion, the FERC held not only that future net salvage costs should be stated at the future cost level at which they will be incurred, but that not doing so would

result in intergenerational inequity.

In the 2013 Opinion at paragraph 175, FERC stated:

> We affirm the Presiding Judge's finding that Entergy has demonstrated that the decommissioning cost estimate should be escalated three percent annually to the retirement dates estimated for Entergy Arkansas' steam production units. Based on the record before us, we agree with the Presiding Judge that it is reasonable for the current decommissioning costs to be inflated to reflect future costs of decommissioning at the time of retirement in order to avoid intergenerational inequities between current and future ratepayers.[78]

Thus, not only did FERC affirm that decommissioning costs should be escalated to the time of retirement, but that not doing so would result in intergenerational inequity. FERC's opinion, therefore, makes clear that escalation must be included for decommissioning costs in order to be consistent with the requirements of the USOA.

FERC's opinion also is contrary to the opinions of Mr. Dunkel, Garrett and Andrews that including the escalated future net salvage cost would produce intergenerational inequity. Instead, FERC has affirmed that the opposite is true. In order to equitably allocate the costs of the Company's power plants, the future cost of decommissioning these facilities must be included in depreciation.

Q. Are you aware of any other commissions that have addressed that the net salvage included in depreciation must represent the future net salvage costs of an asset?

A. Yes. I first note that in most jurisdictions the future net salvage costs are included in

[78] FERC Opinion No. 523, issued January 8, 2013, pp. 76-77, P. 175.

depreciation for non-production assets. This is true in Oklahoma, and is true of each of the other parties' recommendations for net salvage for transmission and distribution assets.

However, one case with which I am familiar specifically addresses the concept of including the future cost for net salvage. A generic proceeding in Michigan addressed the proper treatment of net salvage costs. The Michigan Public Service Commission ("MPSC") concluded that net salvage must be stated as the cost that will be occurred in the future, not today's cost or costs stated in today's dollars. Mr. Dunkel, who testified on behalf of the Michigan Attorney General in that proceeding, had proposed a present value method that was rejected by the MPSC. Specifically, the MPSC stated (emphasis added):

> [T]he net present value approach proposed by the Attorney General has been consistently rejected by most Commissions and does not comport with depreciation methods recommended by authoritative sources on depreciation accounting. The accrual for net salvage must be based on estimates of the future cost that will be incurred, not the removal cost at today's price level. Therefore, it is appropriate to ask current customers to pay for future costs of removal at inflated price levels, and, as Mr. Watson pointed out, the rate base offset compensates rate payers for the prior payment for the costs incurred by the utility. Finally, the Commission finds that the Attorney General's proposed method significantly decreases the cash flows available to utilities to meet their infrastructure and other public service obligations. This, in turn, has a negative financial effect on both the utility and its customers by requiring that such obligations be met with more expensive sources of external financing and by driving up the cost generally of obtaining money in the capital markets. The Commission finds that the Attorney General has not shown that the adoption of the net present value method would justify these increased costs for utility consumers.[79]

[79] Michigan Public Service Commission Order, Case No. U-15629 filed September 29, 2009, page 12.

Q. Each of the other parties discusses present value or time value of money concepts in support of their proposals. Are these concepts typically used for depreciation?

A. No. Depreciation for ratemaking and accounting is based on a cost allocation concept, meaning that depreciation is intended to allocate costs in a systematic and rational manner over the service lives of the Company's assets. It is not based on a value-based concept, in which the current or present value of costs is charged to customers. Concepts such as intergenerational equity are understood on a cost allocation basis, in which equal amounts are allocated to each year an asset is in service (i.e., using the straight line method). As the FERC opinion discussed above makes clear, intergenerational equity means an equal allocation of costs over the life of property, and, in the case of net salvage, this means the future cost.

In their discussions of terminal net salvage, the other parties are attempting to introduce a value-based concept to depreciation. However, they are not doing so consistently. To consistently incorporate a value-based concept, one would have to also incorporate the present or current value of the historical original cost of the Company's assets – not just the net salvage costs. No party has proposed to do so, and no party has raised a concern that, for older assets, current customers pay less on a value basis than customers did at the time these assets were installed. In my view, the most appropriate and equitable approach is to consistently use a cost allocation concept, which is consistent with the Uniform System of Accounts. The other parties proposals to only use a value-based approach for terminal net salvage appears to

instead be results-driven, as they only use a value-based concept when it will reduce depreciation expense.

Q. Do authoritative depreciation texts support that the net salvage amount should represent the future cost?

A. Yes. For example, in the section titled "Salvage Considerations," NARUC explains:

> Under presently accepted accounting concepts, the amount of depreciation to be accrued over the life of an asset is its original cost less net salvage. Net salvage is the difference between the gross salvage that will be realized when the asset is disposed of and the cost of retiring it. Positive net salvage occurs when gross salvage exceeds cost of retirement, and negative net salvage occurs when cost of retirement exceeds gross salvage. Net salvage is expressed as a percentage of plant retired by dividing the dollars of net salvage by the dollars of original cost of plant retired. The goal of accounting for net salvage is to allocate the net cost of an asset to accounting periods, making due allowance for the net salvage, positive or negative, that will be obtained when the asset is retired. This concept carries with it the premise that property ownership includes the responsibility for the property's ultimate abandonment or removal. Hence, if users benefit from its use, they should pay their pro rata share of the costs involved in the abandonment or removal of the property and also receive their pro rata share of the benefits of the proceeds received.[80]

Thus, NARUC is clear that net salvage, and therefore removal costs and decommissioning costs, are the amounts "that will be obtained when the asset is retired." That is, the net salvage amount is the future cost, not today's cost. NARUC also states the following:

[80] National Association of Regulatory Utility Commissioners, *Public Utility Depreciation Practices,* 1996, p. 18. (Emphasis added)
[80] NARUC Manual, p. 18.

> [U]nder presently accepted concepts, the amount of depreciation to be accrued over the life of an asset is its original cost less net salvage. Net salvage is difference between the gross salvage that will be realized when the asset is disposed of and the cost of retiring it.[81] (Emphasis added)

Wolf and Fitch's *Depreciation Systems* ("Wolf and Fitch" or "*Depreciation Systems"*) also addresses net salvage. The authors are clear that net salvage should be included in depreciation and that it should be recognized as a future cost. Wolf and Fitch explain that:

> The matching principle specifies that all cost incurred to produce a service should be matched against the revenue produced. Estimated future costs of retiring an asset currently in service must be accrued and allocated as part of the current expenses.[82]

In the same paragraph the authors are clear that inflation is part of the future cost of net salvage, stating that:

> Negative salvage is a common occurrence. With inflation, the cost of retiring long-lived property, such as a water main, may exceed the original installed cost.[83]

Wolf and Fitch then address intergenerational equity, stating:

> The accounting treatment of these future costs is clear. They are part of the current cost of using the asset and must be matched against revenue. While the current consumers would say they should not pay for future costs, it would be unfair to the future users if these costs were postponed.[84]

Finally, Wolf and Fitch argue against a present value or current value concept. The authors note that:

> Some say that although the current consumers should pay for the future costs, the future value of the payments, calculated at some reasonable interest rate, should equal the retirement cost. Studies show that the salvage is often "more negative" than forecasters had

[82] Wolf and Fitch, p. 7.
[83] Wolf and Fitch, p. 7.
[84] Ibid, p. 8.

predicted.[85]

They also state that:

> "In the accounting framework, depreciation is defined as an allocation process, *not* a valuation process."[86] (Emphasis in original)

Q. Based on the considerations discussed above, should the Commission adopt any of the terminal net salvage recommendations of the AG, OIEC or FEA?

A. No. As discussed above, in order to recover the Company's costs, it is the future net salvage costs that must be included in depreciation. Using current costs, as the AG and OIEC propose, would not be consistent with the requirements of the USOA and would result in intergenerational inequity. Further, FEA's proposal is not consistent with the straight-line method of depreciation, which is almost universally used in the utility industry.

VI. DEPRECIATION RATES FOR NEW ASSETS

Q. Why have you proposed depreciation rates for certain assets that have not yet been placed in service?

A. For certain assets that will be added after the test year, the life or net salvage characteristics are different from other assets in the account. This occurs primarily for generation plant accounts, in which each plant has a unique life span. For this reason, in order to properly allocate the costs of these new assets, I have developed separate depreciation rates. Contrary to Mr. Dunkel's assertion, this is a common practice in the industry and has been used previously in Oklahoma, for example, for smart meters and solar when they were installed.

[85] Ibid, p. 8.
[86] Ibid, p. 4.

Q. Mr. Dunkel claims that the standard practice is to use the approved depreciation rate for an account for any new assets. Please address his criticism.

A. First, Mr. Dunkel is incorrect that for new assets such as generating units that the standard practice is to use the approved depreciation rate for the account. Because the depreciation rates for generating units vary from unit to unit, it is quite common for separate depreciation rates to be developed for new assets.

As support for his position, Mr. Dunkel provides an example of Account 364, Poles, Towers and Fixtures. This is not a relevant example. New poles are, generally speaking, fairly similar to existing poles. It therefore makes sense to use the same depreciation rate that was developed for poles, which would be consistent with group depreciation principles. However, for generation assets the accounts are divided into life span groups, each of which has an estimated retirement date. This is fundamentally different from the poles account, and it is not as reasonable to assume that the depreciation rate for other generating units should apply to any new investments.

Q. Do you have any comments on the specific criticisms Mr. Dunkel makes of the depreciation rates developed for new assets?

A. Yes. Mr. Dunkel argues that the life span for the new Mustang combustion turbines is shorter than other gas turbines. However, this is because Mr. Dunkel is making a comparison to a wide variety of gas plants, from combined cycles to old peaker plants. The most relevant comparison is to the Horseshoe Lake combustion turbines,

for which the same 35-year life span is used as is proposed for the Mustang combustion turbines.

Another plant Mr. Dunkel discusses is Muskogee Units 4 and 5. However, because the new additions to this plant will be in different accounts than the existing assets (other production instead of steam production), it is important that new depreciation rates be developed for these accounts.

VII. CONCLUSION

Q. Do you agree with the recommendations of the AG, OIEC or FEA?

A. No. As I have explained in my testimony, my proposals are reasonable, consistent with accepted depreciation practices, and are most appropriate for the Company's assets. Further, PUD staff agrees that my recommendations should be adopted. The recommendations of the AG, OIEC and FEA are not consistent with accepted practices or produce unreasonable results, and should not be accepted.

Q. Does this conclude your rebuttal testimony?

A. Yes.