BEFORE THE ARKANSAS PUBLIC SERVICE COMMISSION

IN THE MATTER OF THE APPLICATION OF	)	
OKLAHOMA GAS AND ELECTRIC COMPANY	)	
FOR APPROVAL OF A GENERAL CHANGE IN	)	DOCKET NO. 16-052-U
RATES, CHARGES AND TARIFFS	)	

Rebuttal Testimony

of

John J. Spanos

Senior Vice President

Gannett Fleming Valuation and Rate Consultants, LLC

on behalf of

Oklahoma Gas and Electric Company

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 General Staff of the Arkansas Public Service Commission ("Staff") witness Gerrilynn Wolfe and Arkansas River Valley Energy Consumers ("ARVEC") witness David Garrett. Specifically, the issues relate to terminal net salvage, life spans of generating facilities, service life characteristics of various accounts and the net salvage percentages. Each party has challenged the inclusion of terminal net salvage. ARVEC has recommended longer life spans for wind production. Both Staff and ARVEC have recommended different service life estimates for mass property accounts, and Staff has recommended different net salvage estimates for a few mass property accounts. I will address each of these issues in my rebuttal testimony.

Q. Please summarize your rebuttal testimony.

A. The first part of my testimony presents a general discussion of depreciation principles and the depreciation study process. Much of this section will be in response to Mr. Garrett's discussion in his testimony. As I will explain, his opinions on many depreciation concepts are fundamentally incorrect. I then will discuss the process and judgments involved in estimating service lives and net salvage. The primary difference between my study and those of the other parties – Mr. Garrett in particular – is that my recommendations properly consider many important factors and are not solely limited to simple mathematical results. In contrast, the other parties' proposals are in many cases not consistent with accepted depreciation practices. For example, rather than incorporating the proper informed judgment, the mass property service lives recommended by ARVEC Witness Garrett are only based primarily, if not entirely, on mechanical curve matching.

After the general section, I will address in more detail the specific adjustments and criticisms to the depreciation study that each witness proposes. These include:

- <u>Terminal net salvage for production plant accounts</u>. 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. While all parties agree that it would be preferable to have a site specific decommissioning study, such a study is not available at this time. However, this should not mean that nothing is estimated for terminal net salvage, both Staff and ARVEC propose. I have recommended estimates that are consistent with others used in the industry, and as I will explain, are also consistent with estimates from other cases in which ARVEC's witness has been involved. Given that there will be costs incurred upon the retirement of the Company's facilities, terminal net salvage costs should be included in depreciation, and the depreciation study incorporates reasonable estimates of these costs. Mr. Garrett's proposal in the instant case is particularly unreasonable given that his recommendation is contradicted by his recommendation in OGE's recent case in Oklahoma, in which Mr. Garrett testified that OG&E will experience terminal net salvage.

- Wind production plant life spans. The life spans for wind production plant recommended in my depreciation study are 25 years, which is the same estimate currently used for wind by OG&E. This estimate is also consistent with those of others in the industry. ARVEC has recommended a longer 30 year life span. However, as I will explain, his recommendation and testimony do not contemplate relevant factors that cause final retirements of generating facilities and also fundamentally misunderstands depreciation concepts. Further, most of his discussion is based only on how long the plants could physically last, and does not properly incorporate other factors that could result in the retirement of wind facilities at an earlier age.

- Mass property life analysis. Staff and ARVEC 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 incorporate proper judgment. Authoritative depreciation sources are clear that judgment must be employed so that the resulting service lives are reflective of the property being studied.

  Staff's estimates of average service lives are generally reasonable, however, for some accounts the average service life combined with the survivor curve produces unrealistic life characteristics. As a result, some of Ms. Wolfe's estimates produce a full life cycle which does not represent a proper recovery pattern and should not be adopted by the Commission.

  ARVEC's estimates are inappropriately based primarily on mathematical curve matching results and ARVEC does not appear to have applied the necessary judgment to make reasonable estimates. As a result, Mr. Garrett's estimates are unreasonable and unrealistic for the property studied. For example, Mr. Garrett has estimated that a portion of the Company's overhead transmission poles account will remain in service for more than **150 years**. Given that Mr. Garrett's process has resulted in what amounts to very unreasonable estimates, his recommendations should not be adopted by the Commission.

- <u>Mass property net salvage</u>. ARVEC and Staff have agreed with almost all the net salvage percentages recommended by the Company for mass property. ARVEC has not challenged any net salvage percentages while Staff only challenges two accounts. The two accounts that Ms. Wolfe proposes different net salvage percents are Account 356 and Account 365. Ms. Wolfe's proposals do not incorporate needed informed judgment as prescribed by authoritative texts and applies an emphasis on 2015 data which was not part of the Company's proposal. The 2015 data in Ms. Wolfe's analyses does not consider the cost of removal and gross salvage that has yet to be closed to the associated retired plant.

- <u>Amortization of software for electric plant</u>. ARVEC recommends a 15 year average service life for all of the Company's software assets. ARVEC's recommendation is incorrectly based on the potentially longer life of larger enterprise software systems, but is not appropriate to be applied to all of the Company's software assets. Given the types of applications in this account, as well as the possibility for obsolescence, the current 10 year life is most appropriate for this account.

II. DEPRECIATION PRINCIPLES AND THE DEPRECIATION STUDY PROCESS

Q. What is the issue in this section of your testimony?

A. Based on the testimonies and recommendations of other parties, it is important to explain both the objective of depreciation and the process for a depreciation study in more detail. In particular, it is important to explain that depreciation is intended to recover the costs of a company's assets over the actual period of time they will be in service. It is also necessary to explain the process for estimating or forecasting service lives and net salvage.

Q. Why do you believe it is important to explain these concepts?

A There are two main reasons. The first is to respond to the discussion on pages 7 and 8 of Mr. Garrett's testimony in which he argues that "it is better that useful lives are overestimated rather than underestimated."[1] Mr. Garrett's opinion on this matter is fundamentally incorrect and inconsistent with ratemaking principles. His discussion completely ignores the concept of intergenerational equity, which is one of the primary goals when establishing depreciation rates. The second reason is that Mr. Garrett's, and to a lesser degree Ms. Wolfe's estimates of service lives are based too much on mechanical curve matching and do not incorporate proper judgment.

A. Depreciation Principles

Q. What is depreciation?

A. Depreciation is defined in the FERC Uniform System of Accounts:

> 12. Depreciation, as applied to depreciable electric plant, means the loss in service value not restored by current maintenance, incurred in connection

[1] Direct Testimony of David Garrett, p. 8, lines 4-5.

> with the consumption or prospective retirement of electric plant in the course of service from causes which are known to be in current operation and against which the utility is not protected by insurance. Among the causes to be given consideration are wear and tear, decay, action of the elements, inadequacy, obsolescence, changes in the art, changes in demand and requirements of public authorities.

Q. What is the objective of depreciation?

A. 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 USofA 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[2] of depreciable property over the service life of the property.

Thus, the USofA confirms that depreciation represents the allocation of the full costs of a company's assets (original cost less any net salvage) over their service lives – that is, over the period of time the assets are providing service. Costs are allocated over the service lives of the assets so that customers pay for the costs of the assets that provide them service. Current customers should not pay for the costs of assets that have already been retired. Similarly future customers should not have to pay for the costs of assets that are no longer in service because current customers pay too little for their service.

Q. What is the concept of "intergenerational equity"?

A. Intergenerational equity is a ratemaking principle in which customers receiving the benefit from the use of an asset (e.g., from electric utility property used to provide electric service) are the same customers who pay the cost of that asset – no more, no less. There are actually two related concepts when considering intergenerational equity as it pertains to depreciation. The first is the inequity that results from a situation in which customers pay for assets from which they receive no service. For example, if a power plant is retired before becoming fully

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

depreciated, then customers subsequent to the retirement will have to pay for an asset from which they are not receiving service. This is inequitable, as one generation of customers bears the cost of an asset from which they receive no service but that that provided service to an earlier generation. The second concept is instead related to the distribution of depreciation charges over the life of an asset. For example, if depreciation expense is higher in the earlier years of an assets life and lower in later years (or vice versa), this could also be considered inequitable because one generation of customers pay a higher share than a different generation.[3]

In my view, the first concept related to intergenerational equity is more harmful to customers than the second. That is, there is a greater degree of inequity that results from a customer paying for an asset that only provided service to other generations of customers – and not to him or her – than results from one generation paying somewhat more or less than a previous generation for the same asset. Additionally, I would add that depreciation is necessarily a forecast of future events (such as the actual retirement date of a power plant) that will occur many years in the future. It is therefore nearly impossible to perfectly allocate costs equally over the lives of a utility company's entire asset base. However, if the temptation is resisted to increase service lives and reduce estimates of removal costs to unreasonable levels for the purpose of reducing depreciation expense in the short term (as Mr. Garrett proposes), the risk of the inequity of having future customers pay for assets from which they receive no service can be mitigated, if not eliminated.

Q. Mr. Garrett argues that "it is better that useful lives are overestimated rather than underestimated."[4] Please address his discussion of this concept.

A. In my view, which is shared by authorities on ratemaking principles, Mr. Garrett's opinion is fundamentally incorrect. First, for Mr. Garrett to even make such a

[3] I note here that one assumption inherent to this concept of equity is that the consumption of an asset is relatively equal over its useful life. However, this is not necessarily the case. For example, capacity factors of power plants typically tend to decrease over time, and thus the benefit to customers is often greater in the early years of the assets life than in the later years.

[4] Direct Testimony of David Garrett, p. 8, lines 4-5.

claim he must dismiss the entire concept of intergenerational equity. While he states that "unintentionally overestimating depreciable lives (i.e., underestimating depreciation rates) does not harm the Company" and then argues that "if an asset's life is overestimated, there are a variety of measures that regulators can use to ensure the utility is not financially harmed,"[5] Nowhere in his discussion is there even an acknowledgment that such a situation would by definition result in intergenerational inequity. Thus, Mr. Garrett appears to have not even considered the concept and the fact that "overestimating depreciable lives" will most certainly harm future generations of customers who will unfairly be required to pay for assets that do not provide them service.[6]

Further, Mr. Garrett does not acknowledge that if depreciation rates are too low (for example, if lives are "overestimated") the cost to customers will over the long term actually be higher, all else equal. This occurs because accumulated depreciation is an offset to rate base. If depreciation expense is too low, then accumulated depreciation will be lower than it otherwise would be, producing a rate base that is higher than it otherwise would be. Thus, if customers pay too little in depreciation expense, they will have to pay a higher return on rate base due to the fact that rate base will be higher. As a result, over the long term depreciation rates that are too low actually produce a higher total cost to customers. Mr. Garrett's preferred approach to minimize depreciation expense is not only harmful to customers in that it is likely to produce intergenerational inequity, but also because it will likely result in higher overall customer rates over the long term.

Q. You have explained the flaws in Mr. Garrett's reasoning. Do any ratemaking or depreciation texts support your position on these concepts and principles?

A. Yes. One of the foremost ratemaking texts is James Bonbright's *Principles of*

[5] Direct Testimony of David Garrett, 7, lines 13-16.

[6] I further note that Mr. Garrett's casual discussion of measures that could be used to "ensure the utility is not financially harmed" ignores that utilities still bear a risk that such "measures" would not be used and instead the utility could be harmed by the disallowance of stranded costs.

Public Utility Rates.[7] Bonbright addresses whether it is preferable to err on the side of higher depreciation as opposed to lower depreciation. Bonbright concludes that it is preferable to overestimate depreciation expense as opposed underestimate depreciation expense. Bonbright refers to this as a criteria of "conservatism", and states:

> This criterion suggests that, as between two proposed methods of cost amortization, one of which undertakes faster write-offs than the other during the early years of useful service lives, any reasonable doubt may well be resolved in favor of the former unless, on consequence, the resulting temporarily higher rate levels will be a serious deterrent to the development of a demand for utility services commensurate with plant capacity.[8]

Thus, Bonbright supports the exact opposite conclusion of Mr. Garrett's opinion on this matter.

Q. Mr. Garrett also argues that "if a utility is allowed to recover the cost of an asset before the end of its useful life, this could incentivize the utility to unnecessarily replace the asset in order to increase rate base, which results in economic waste."[9] Does Bonbright also address this concept?

A. Yes. Bonbright first recognizes the concept I have explained previously – that higher depreciation rates will, all else equal, result a lower cost to customers in the long term. Bonbright states:

> From the standpoint of price economics, the danger of excessively rapid capital-cost amortization is that the resulting rates of charge for service will initially be too high, but may eventually become too low. That is, if these rates, when freed from the burden of fixed charges, should fall below marginal or incremental costs of

[7] The first edition of this text was published by Bonbright in 1961. The second edition, from which I will cite in my testimony, was authored by Bonbright, Albert Danielsen and David Kamerschen and published in 1988.
[8] *Principles of Public Utility Rates*, James C. Bonbright, Albert L. Danielsen and David R. Kamerschen (1981), p. 279.
[9] Direct Testimony of David Garrett, p. 7, lines 8-10.

production (including the costs of necessary increments of plant and equipment), wasteful over consumption would result. But the case is not at all clear, for the acceptance by ratepayers of a slightly higher current rate level may be a price well worth paying for lower rate levels in the long run. Again, the selection calls for reasonable compromise.

However, there are at least two reasons in support of the canon of conservatism. The first is the more obvious one that a public utility company may be better protected in its opportunity to enjoy a complete recoupment of its capital investments, combined with a fair rate of return on the unrecouped portions, if the attempted rate of recoupment is fairly rapid during the early years of the service lives of its assets. If recoupment is delayed until obsolescence has proceeded beyond a somewhat ill-defined limit, the traffic may no longer bear, nor public opinion tolerate, rates of charge for service high enough to continue the procedure thereafter. The recent experience of AT&T and the Bell operating companies in depreciating customer premises equipment illustrates strikingly this danger.

The second reason in favor of liberal depreciation allowances during early years of service life concerns the effect of the allowances on the replacement policies of management. As guardians of the investor interests, a management naturally will be reluctant to replace obsolete equipment with new equipment, even if otherwise desirable, if the accompanying retirement of the old assets will result in a reduction in the valuation of the company's properties for the purposes of rate regulation. Hence, a management may be impelled to delay the replacement, against the dictates of sound economics, until the cost of the old asset has been completely amortized. The danger of this drag on progressive

> technology will be reduced if the assets are written down to minimum book values safely ahead of the fates on which they ought to be retired or relegated to stand-by service. Again, one may cite the case of telecommunications premises equipment.

Thus, Bonbright argues strongly against Mr. Garrett's opinion. I note here that while examples provided in the passages cited above reference the telecommunications industry, the electric industry has had similar experience in recent years, for example with the retirements of coal-fired power plants and legacy meters.

I would further note that Bonbright's second reason in favor of "liberal depreciation allowances during early years of service life," which responds to Mr, Garrett's argument with regard to "economic waste," is pertinent not only to "price economics" but to other important issues of value in terms of utility service. Specifically, the operation of utility assets for too long can impact factors other than price, such as reliability and customer service. For example, if utility poles remain in service for too long, the aging infrastructure could adversely affect reliability. Similarly, if depreciable lives are too long then a company's aversion to replacing undepreciated assets could result in a reluctance to upgrade devices or software to improved technology, which could also impact reliability as well as customer service.

Q. Having shown that Mr. Garrett's discussion of depreciation principles is incorrect and incomplete, how do these principles impact the specifics of the instant case?

A. The discussion above demonstrates that Mr. Garrett is mistaken with regard to depreciation principles, and provides support that all else equal, it is better to be conservative with depreciation estimates. However, in the instant case, all else is not equal. Mr. Garrett's recommendation are in many cases unreasonable and unrealistic. Whether this is because he is ignoring commonly accepted depreciation practices, such as the lack of judgment incorporated into his service life estimates for property, or ignoring his own testimony on OG&E's assets provided previously in Oklahoma, the result is that Mr. Garrett's recommendations are unreasonable, highly likely to result in intergenerational inequity and likely to place an unfair burden and higher electric rates on future generations of customers.

Q. Please provide examples that demonstrate the unreasonableness of Mr. Garrett's recommendations.

A. One example is Mr. Garrett's recommendation for terminal net salvage. Mr. Garrett "removed the terminal net salvage" from his recommended depreciation rates.[10] That is, he recommended no terminal net salvage. This means that his depreciation rates anticipate that the Company will incur no costs at all upon the retirement of its power plants. Not only is this in contradiction of reality – companies typically incur costs not only to dismantle the actual power plant but also to remediate coal ash ponds and other parts of the site – but Mr. Garrett's recommendation is in direct contradiction of his recommendations elsewhere, including his recommendation for the exact same power plants for the exact same Company. In OGE's rate case in Oklahoma, Mr. Garrett testified that "it is very likely that there will be some amount of negative net terminal salvage when OG&E's generating units are eventually retired," that "the Commission should not completely disallow recovery of decommissioning costs in the case." For OG&E's Oklahoma case Mr. Garrett recommended depreciation rates that included terminal net salvage (or decommissioning) costs.[11] That is, Mr. Garrett's recommendation in the instant case is contradicted by his own testimony and recommendations for OGE in Oklahoma, and therefore should not be considered reasonable.

Another example is Mr. Garrett's approach and recommendations with regard to mass property service lives, which I will address in more detail in the next section. Mr. Garrett's primarily mechanical approach to life estimation – which is in direct contradiction to depreciation authorities – results in

[10] Direct Testimony of David Garrett, p. 18, line 8.

[11] Direct Testimony of David Garrett in Oklahoma Cause No. PUD 201500273, p. 19, lines 12-17.

unreasonably long service lives. For example, his depreciation rates anticipate that a portion of the Company's overhead transmission poles account will remain in service for more than **150 years**. This is an unrealistic expectation that results in unreasonable depreciation rates.

These examples demonstrate that although Mr. Garrett's opinion is that his recommendations "represent the lowest *reasonable* rates when compared to the Company's proposed rates,"[12] the actual circumstances – including Mr. Garrett's own testimony elsewhere – make clear that his recommendations are not reasonable.

B. <u>The Depreciation Study Process</u>

Q. Can you explain the process for estimating service lives and net salvage?

A. A depreciation study requires the estimation of events that will happen many years in the future. For example, the average service lives for the Company's assets such as transmission poles and transmission conductors are fifty years or more. Many individual assets will live longer than the average. Thus, the depreciation study must predict what will occur over the next fifty years or more. There are tools available to aid in forecasting service lives and net salvage, such as the statistical analyses of historical data. However, the Commission should not lose sight of the fact that depreciation is necessarily a forward looking process in which uncertain events are being forecast many years into the future.

Because depreciation is a process of forecasting the future, it is impossible to predict what will occur with 100% precision. The statistical tools available by definition consist of imperfect information, because the Company's assets have only lived for a fraction of their lives. Therefore estimation requires extrapolation and judgment, which must incorporate the knowledge and experience of the depreciation professional performing the study. For example, the curve fitting process for life analysis may result in a wide range of average service live estimates that could be supported by the data alone. The judgment of the

[12] Direct Testimony of David Garrett, p. 10, lines 9-10.

depreciation professional making the estimate is therefore required to differentiate between these possible estimates. Mr. Garrett, and to a lesser degree Ms. Wolfe, place too much emphasis on mathematical results and too little consideration to judgment and other factors. The result of Mr. Garrett's flawed approach, as I will explain, is unreasonable forecasts of service lives.

Q. Do any authoritative sources recognize the necessity of judgment in a depreciation study?

A. Yes. The National Association of Regulatory Utility Commissioners ("NARUC") 1996 publication Public Utility Depreciation Practices (referred to as the "NARUC Manual") is a well-regarded, authoritative depreciation text. The NARUC Manual has an entire section dedicated to "informed judgment." NARUC defines "informed judgment" as:

> [A] term used to define the subjective portion of the depreciation study process. It is based on a combination of general experience, knowledge of the properties and a physical inspection, information gathered throughout the industry, and other factors which assist the analyst in making a knowledgeable estimate.[13]

NARUC also notes that "the use of informed judgment can be a major factor in forecasting"[14] and explains that "[t]he analyst's judgment, comprised of a combination of experience and knowledge, will determine the most reasonable estimate."[15]

Q. In addition to the statistical life and net salvage analyses, have you utilized informed judgment related to OG&E's Depreciation Study?

A. Yes. As is the typical practice for depreciation studies performed by my firm, I have conducted field reviews and met with operations and engineering management for OG&E. These reviews and meetings provide valuable insight into the operations of the Company's assets and the plans and outlook for the

[13] *Public Utility Depreciation Practices*, National Association of Regulatory Utility Commissioners, 1996, p. 128

[14] Ibid.

[15] Ibid., p. 129

assets as only Company management would understand. Information obtained from these field reviews and meetings is invaluable.

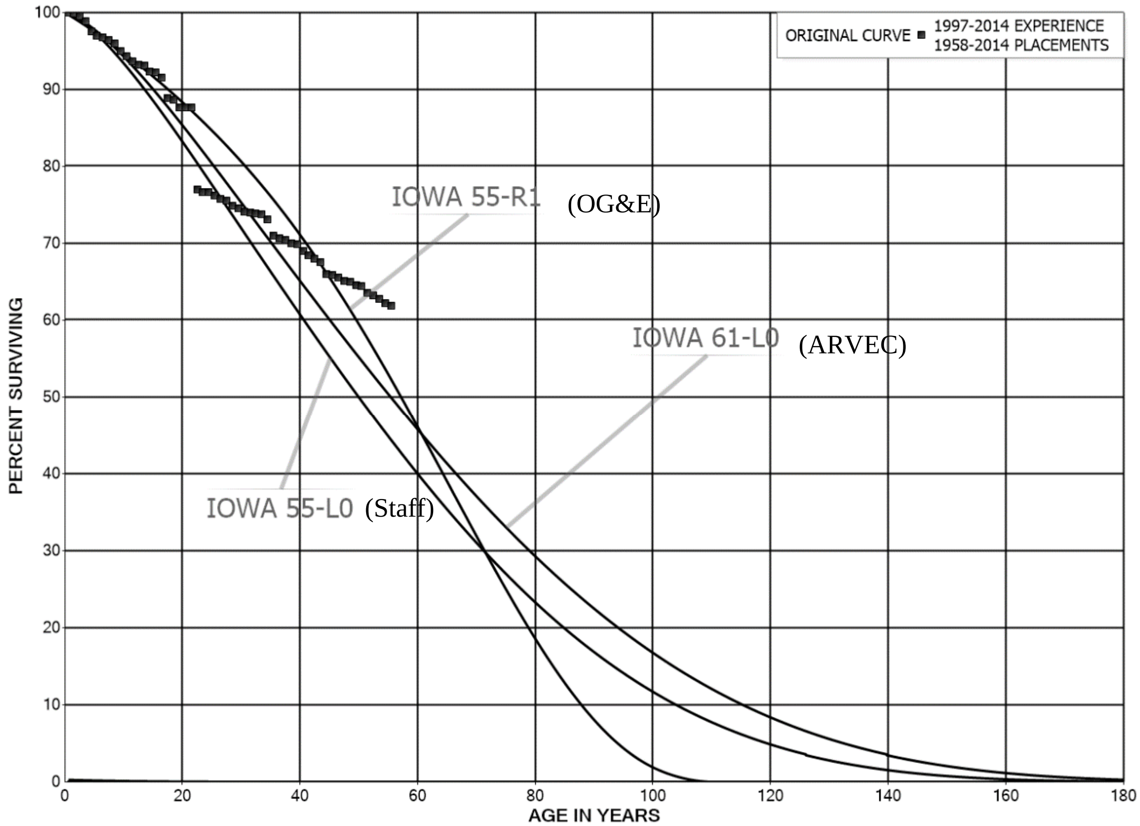
Further, over the course of my career I have performed hundreds of depreciation studies, and have conducted similar field reviews and management meetings. These have provided a wealth of knowledge and experience as it pertains to the operations and life and net salvage characteristics for utility property. All of this knowledge informs my judgment and contributes to reasonable estimates of service lives and net salvage.

Q. Can you provide an example of why judgment must be used when estimating service lives?

A. Yes. I will use Account 355, Poles and Fixtures as an example. Figure 1 below provides a graph of the Company's historical data (black squares on the graph), as well as the estimates for the Company, Staff and ARVEC. The statistical life analysis for the study consists of fitting or matching smooth Iowa survivor curves to the Company's historical data. For OG&E, there are 18 years of data and the historical data for this account is not definitive in terms of determining a service life estimate. There are a variety of different survivor curves that can be fit to the historical data.

The OG&E, Staff and ARVEC curves shown on the graph all fit different portions of the historical data. Each could represent a possible candidate for the service life estimate. Because each matches different portions of the curve, judgment is required to select the most appropriate estimate from possible candidate curves.

Figure 1



Q. What observations do you have for this account that inform your judgment in selecting the most appropriate survivor curve estimate?

A. The first item to note on the graph is that the historical data does not provide a full indication of the service life characteristics for this account, since the black squares do not extend to zero percent surviving (instead the squares only go to a little more than 65% surviving). This is a common occurrence when conducting a depreciation study, as data for the full life cycle of an account is normally not available. Therefore, it is necessary to extrapolate – using judgment - the remaining portion of the curve. For this account, the original data only goes as far as about 60-65% surviving, therefore more than 60% of the retirement experience for this account needs to be extrapolated. That is, there is no meaningful experience for most of the life cycle of the account.

The second item to note is that for the portion of the graph for which there is data – that is, up until about age 57 – OG&E's, Staff's and ARVEC's curves could be considered matches of some portion of the historical data, although none match the full range of historical data particularly well. This is because the historical data for this account is not definitive, and therefore judgment must be used to determine the most reasonable service life estimate. As can be seen on the graph, the biggest differences between the three curves are due to the extrapolation of the curve, and not to the historical data or the degree to which the curves fit the actual historical data. That is, the portion beyond the available historical data is where the three curves are most different. It is this portion of the curve that makes clear that OG&E's estimate is much more reasonable than those of Staff and ARVEC.

Q. Given that there is incomplete data and all three curves are reasonable fits of the data, how does one differentiate between the curves?

A. Again, this is where judgment comes in to play. For example, ARVEC's 61-L0 estimate forecasts very long lives for a large portion of the assets in this account. For example, ARVEC forecasts that over 15% percent of the assets in this account will last more than 100 years and that almost 10% will last more than 120 years. In my judgment this is an unreasonable expectation, as the Company cannot provide reliable electric service with so many very old overhead transmission wires. Staff's recommendation is only modestly better, and, as can be seen in the graph, also forecasts that a portion of the assets in the account will remain in service for an unreasonably long period of time. Given these considerations, my estimate is the only curve shown that provides a reasonable estimate of the future service life characteristics for this account.

Q. Please summarize the depreciation study process.

A. The depreciation study I have performed has been conducted in accordance with industry standards and incorporates the proper judgment in making service life and net salvage estimates. Unlike Mr. Garrett, I have observed OG&E's property and have discussed service life and net salvage expectations with OG&E management, and unlike both Staff and ARVEC my recommendations are reasonable for the types of property studied.

III. 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. In a later section I will discuss the component of net salvage related to interim retirements.

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.

Q. Do both types of net salvage need to be recovered over the life of a power plant?

A. Yes, they do. Consistent with the FERC Uniform System of Accounts and authoritative depreciation texts, the service value of a power plant (or any asset) must be recovered equitably over its service life. The service value is the original cost less net salvage, and therefore contains both interim and final net salvage. No party appears to disagree with the concept that net salvage should be recovered through depreciation rates, but both Staff and ARVEC have recommended zero terminal net salvage for production facilities. Regardless of any disagreements about the actual amounts that should be estimated for terminal net salvage, it is certain that an estimate of zero is incorrect. Indeed, Mr. Garrett has recommended a terminal net salvage estimate for the exact same OG&E power plants in the Company's most recent case in Oklahoma. Further, there should be no argument that the Company will incur costs upon the retirement of its power plants. For example, as a result of the EPA's solid waste management and disposal rules or requirements for asbestos removal, companies across the country may have to spend significant dollars once units are retired. These costs should be recovered over the life of the power plants.

Staff's and ARVEC's recommendations to eliminate terminal net salvage costs will result in these costs being deferred until after the retirement of the facilities. This will result in intergenerational inequity, as future customers will have to pay the decommissioning costs for plants from which they will not receive service.

Q. What is the basis for your estimates of terminal net salvage?

A. Because the Company has not yet performed a site specific decommissioning study, I based the terminal net salvage estimates on typical estimates for each type of facility used by others in the industry. For each type of production plant the estimates are made on a dollar per kilowatt basis. By using a value per kilowatt, larger plants will have a larger decommissioning cost estimate and smaller plants will have a smaller decommissioning cost estimate.

Q. What are the estimates per kilowatt for each type of plant?

A. For steam production plants, the estimate is that decommissioning will cost $40 per kW. For other production plant, excluding wind, the estimate is $10 per kW. For wind production plant the estimate is $5 per kW.

Q. Can you further detail how you determined that these $/kW amounts are reasonable?

A. First, I must state the $ per kW estimates were determined based on experience of other engineering firms that specialize in decommissioning studies. Although these studies are proprietary to the individual company, the level of decommissioning were comparable to what is utilized for OG&E. Also, as stated in my oral testimony OG&E Case, PUD 201500273) the initial calculations of terminal net salvage was presented at an American Gas Association / Edison Electric Institute conference in 1993. That presentation also supports the $ per kW levels utilized by OG&E, and the more current studies of Sargent & Lundy, Burns & McDonnell and Black and Veatch. My levels of $ per kilowatt is based on 30 to 40 studies by these firms and others.

Q. Can you provide examples of other cases in which terminal net salvage was an issue?

A. Yes. One such case is for Rocky Mountain Power Company in Utah (Utah Docket NO. 13-035-02). In that case the Company did not have a decommissioning study performed and proposed $40 per kW for steam, $20 for other production (excluding wind) and $9 per kW for wind. The support in that case was similar to what has been provided in the current OG&E case. The estimates that are currently used by Rocky Mountain Power (they were approved through a stipulation) are similar[16].

It is notable that while some parties in that case challenged the per kW estimates, they did not propose $0 terminal net salvage, as ARVEC and Staff do in the instant case. For example, the Office of Consumer Services in the Rocky Mountain Power case recommended $30 per kW for steam, $8 per kW for other production excluding wind and $5 per kW for wind production. Thus, these estimates in the Rocky Mountain Power case were much closer to my estimates in OG&E's case than his $0 estimate. This should provide further evidence that a $0 terminal net salvage estimate is unreasonable.

Another example is a case for Nevada Power Company. Nevada owns both coal fired generation and gas other production (primarily combined cycle plants). Thus, many of its plants are comparable. I have presented the approved decommission estimates in a $/kW basis for each of Nevada Power's plants in Table 1 below. These estimates were based on site specific decommissioning studies and are the approved estimates from a fully litigated proceeding. The estimates shown in Table 1 for coal

[16] Steam facilities are $40/kW, other production are $15/kW and wind is $9/kW.

plants range from $41.1/kW to $91.7/kW, and are all higher than the Company's estimate in this proceeding. They are obviously much higher than ARVEC and Staff's estimates of $0. The Sunrise plant, which is not a coal unit, has an estimate of $33.7/kW, which is also higher than ARVEC and Staff's estimates of $0. For the combined cycle plants, the estimates range from $8.6/kW to $20.5/kW (and to $69.3 $/kW if the older Clark plant is included). Thus, the Nevada Power estimates provide support that the estimates I have made for OG&E are consistent with those from more detailed decommissioning studies as approved by a commission.

Table 1: Approved Decommissioning Estimates for Nevada Power Company

Plant	Cost/kW
Steam Production Plants	
Clark	69.3
Reid Gardner 1-3	90.4
Reid Gardner 4	91.7
Sunrise 1	33.7
Navajo	41.4
Combined Cycle Plants	
Clark 5-8	69.3
Harry Allen 5, 6, 7	18.3
Higgins	20.5
Lenzie	11.9
Silverhawk	8.6
Other Plants	
Clark 4	5.1
Clark 11 to 22	6.9

Goodsprings	107.3
Harry Allen 3, 4	14.2
Sunrise 2	33.7

Q. Why have you calculated terminal net salvage in this manner for OG&E?

A. The purpose of depreciation is to accurately estimate the full service value of all assets over its useful life. Therefore, the weighted net salvage calculations which are performed for all generation facilities is to more accurately estimate the full service value.

Q. Has the level of support and methodology you utilized been accepted in other cases for terminal net salvage?

A. Yes.

Q. Staff and ARVEC recommend that the Company should perform a site specific decommissioning study for its next rate case. Do you agree that a site specific decommissioning study would be appropriate?

A. Yes. This is an area of agreement between all parties. A site specific decommissioning study typically provides the best estimate of terminal net salvage costs for a power plant, so I would also prefer to incorporate the results of such studies into depreciation.

However, just because OG&E has not yet been able to perform site specific studies does not mean that the estimates for terminal net salvage should be zero, as Staff and ARVEC have proposed. As I will explain in more detail, terminal net salvage costs should be expected for the Company's power plants. Failing to include any costs for terminal not salvage will not only result in current customers paying too little for these costs, but will result in an even sharper increase in rates once a decommissioning study is performed.

Q. Has Mr. Garrett testified elsewhere that OG&E's plants should be expected to incur terminal net salvage cost and that terminal net salvage costs should be included in OG&E's depreciation rates?

A. Yes. As noted previously in Section II.A, in OGE's rate case in Oklahoma, Mr.

Garrett testified that "it is very likely that there will be some amount of negative net terminal salvage when OG&E's generating units are eventually retired," that "the Commission should not completely disallow recovery of decommissioning costs in the case," and recommended depreciation rates that included terminal net salvage (or decommissioning) costs.[17] It makes no sense that Mr. Garrett would support including terminal net salvage for OG&E in Oklahoma but recommend to completely exclude these legitimate costs in Arkansas.

Q. Can you provide an example of a comparable utility to support the terminal net salvage costs for OG&E?

A. Yes. PSO has submitted dismantlement studies in its recent depreciations studies.

Q. Are OG&Es total terminal net salvage estimates in the same range as those established for PSO?

A. Yes. However, there are some differences between how the terminal net salvage is determined between PSO and OG&E. For steam facilities, the OG&E estimate is $40/KW while the range for PSO which had decommissioning studies performed is $18/KW to $60/KW before escalation.

Q. You indicated that PSO included terminal net salvage in its most recent cause. Were any witnesses in OG&E's current case involved in that case?

A. Yes. Mr. Garrett was a witness in Oklahoma Cause No. PUD 201500208.

Q. Did he include terminal net salvage in his depreciation proposals in that case?

A. Yes. While he made some adjustments to the terminal net salvage estimates in PSO's depreciation study, Mr. Garrett included terminal net salvage in his recommended depreciation rates.

Q. What do you conclude regarding terminal net salvage?

A. All parties agree that the preferred approach is for OG&E to perform a site specific decommissioning study. This study can provide the basis for terminal net salvage in future depreciation studies. However, while OG&E has not been able to prepare such a study at this point in time, intergenerational equity requires that

[17] Direct Testimony of David Garrett in Oklahoma Cause No. PUD 201500273, p. 19, lines 12-17.

today's customers pay their share of the ultimate costs to retire the Company's power plants. That is, there is still the need to incorporate terminal net salvage in depreciation rates in the instant case. Decommissioning costs will occur, and therefore they must be incorporated into depreciation expense today so that current customers pay their fair share and so that future customers do not bear an undue burden.

Absent a site specific study, I have recommended estimates for each facility that are consistent with those used by others in the industry. These estimates are in my judgment reasonable to establish terminal net salvage costs for this proceeding, and can be revised in future studies when a site specific decommissioning study is available. Staff and ARVEC's estimates of $0 terminal net salvage are without a doubt incorrect. The Company should be expected to incur terminal net salvage costs, as Mr. Garrett has acknowledged in other proceedings and testified to for OG&E's plants. At a minimum, the Commission should allow the same recovery as Mr. Garrett testified to and the Oklahoma Commission adopted for OG&E in Oklahoma.

IV. WIND PRODUCTION PLANT LIFE SPANS

Q. What is the issue in this section of your testimony?

A. In this section I will address the recommendation of Mr. Garrett to increase the life span for wind facilities from 25 years to 30 years.

Q. What is the current life span estimate for wind facilities?

A. The current estimate is 25 years.

Q. What basis does Mr. Garrett use to justify increasing the life for wind plants?

A. Because wind production, and in particular modern wind generators, are a relatively new technology there is limited actual experience on which a life span can be based. Most facilities are well under 25 years of age, and thus there is uncertainty as to how long wind facilities will provide service – the actual life spans for most facilities will be unknown for many years. Therefore Mr. Garrett's recommendations to increase the life spans are not based on actual experience but based on his expectations of how long wind assets could last.

Q. Has Mr. Garrett discussed the outlook for wind facilities with OG&E management?

A. No (or if he has he does not references any discussions with OG&E in his testimony). Given that he has not had any discussions with OG&E personnel, Mr. Garrett has not incorporated the outlook of OG&E - the actual operators of the facilities - into his estimates. Additionally, Mr. Garrett has testified to have little understanding of the size of wind turbines and more importantly, his testimony in OG&E PUD 201500273 he stated he was not aware of the specifics of wind turbines operated by OG&E.

Q. Is a 30 year life span common in the industry?

A. No. While there are a few utilities that have used a thirty year life span, shorter life spans are far more common. Life spans of 20 to 25 years are most common.

Q. Can you distinguish the differences between the few utilities that use a 30-year life span versus the more common 20-25 year life spans?

A. Yes. The primary difference between the majority of wind farms life spans of 25 years and the few that utilize 30 years is the size of the turbine. Generally speaking, wind turbines that are below 2.0 MW will require a complete rebuild because in 25 years technology will be utilizing larger turbines and the current tower and foundation will not be able to be utilized with a larger turbine. The turbines above 3.0 MW have been constructed to handle a larger turbine. The OG&E turbines fit into the 25 year life span category.

Q. What arguments does Mr. Garrett use to support increasing the life span for wind?

A. Mr. Garrett's arguments are primarily focused on how long wind <u>could</u> be in service from a physical standpoint to support a longer service life. However, the life span established for depreciation is not a reflection of how long an asset could physically last, but instead must incorporate all possible causes of retirement to estimate the most probable life span.

Q. Please explain what you mean by causes of retirement?

A. The retirement of an asset such as a power plant does not necessarily occur at the point when the plant can no longer physically operate. Instead, retirement typically occurs when it becomes more economical to replace the plant with newer technology generation. This may occur for a variety of reasons, such as environmental regulations, the cost of operation, new technology or changing needs within the electric system.

Mr. Garrett[18] has raised the analogy of a car and the life of a car. To elaborate on this analogy, a car can theoretically operate for many years. However, in order to do so the owner would typically be required to invest a significant amount of money into repairs for both minor and major parts. Further, these costs tend to increase over time as the parts of a car age. Thus, most car owners reach a point where it is economical to replace their car – even though the car could theoretically operate for much longer if enough investments were made in the car.

The same is true of power plants. Just as the life of the car should not be based on how long it could theoretically last, the life span of a power plant should consider more than just how long the plant physically could remain in service. Other factors must also be considered.

Q. What other factors should be considered?

A. One major factor, especially for newer technologies, is the pace of technological improvements. As wind plants age and become less efficient and more costly to operate (for example, as items such as gearboxes fail and need to be replaced), it will become more economical to repower the facility with newer, more efficient wind turbines. This will require rebuild of most wind farms.

Q. Has there been any experience of this type of repowering?

A. Yes. Many of the earliest generation of wind farms (constructed in the 1970s and 1980s) were repowered with more modern technology. Further, the replacement of major components such as the turbines also will likely result in the replacement

[18] See the Direct Testimony of David Garrett p. 13-14.

of assets such as foundations and towers. When a company makes a significant investment to replace 25 year old turbines, it will likely be economical to replace them with modern, and much more efficient, turbines with higher output. Newer, larger turbines will require larger towers and stronger foundations. Thus, it is likely that the retirement of turbines after 25 years will result in the rebuilding and repowering of most of the assets at the site. Indeed, this has occurred with older generations of wind farms. For example, the Cameron Ridge wind project had a commercial operation date of 1984. The site was repowered in 1999 at 15 years of age with newer, more efficient generating units.

Q. Mr. Garrett claims that "for each group of assets comprised within OG&E's wind facilities, the Company is proposing average lives much longer than 25 years."[19] Please address this claim.

A. Not only is Mr. Garrett's claim incorrect, but he demonstrates a fundamental lack of understanding of life span survivor curve estimates. Interim retirements for life span property are estimated using an Iowa curve, the shape of which is described by an "average service life" and a curve name (e.g., "R2"). However, the "average service life" used to describe the shape of an interim survivor curve is not the actual interim survivor curve. Instead, the survivor curve is truncated at the date of the final retirement of the facility, and the actual average service life is less than or equal to the overall life span of the facility. Mr. Garrett is therefore incorrect to assert that I have proposed average service lives that "are much longer than 25 years" for the Company's wind assets, and his Figure 2 on page 20 of his testimony incorrectly identifies the "average life" proposed by the Company for each account. Instead, the average service lives I have actually recommended are for 25 years or less, consistent with the Company's outlook for its wind facilities.

Thus, my interim survivor curves do not in any way "suggest that the Company's wind facilities should last much longer than 25 years."[20] Instead, Mr.

[19] Direct Testimony of David Garrett, p. 20, lines 4-5.
[20] Direct Testimony of David Garrett, p. 20, lines 5-6.

Garrett's testimony only serves to demonstrate that he does not properly understand depreciation concepts related to life span property.

Q. Mr. Garrett advances an argument that there has been a "tendency to underestimate the lives of generating plants with relatively new technology."[21] Please address this argument.

A. While Mr. Garrett notes that many generating facilities may have exceeded their initial life spans, what he omits is that in recent years many plants have been (or are planned to be) retired prior to their estimated life spans. For example, many coal fired power plants are being retired earlier than was anticipated in depreciation rates. This issue creates stranded costs and intergenerational inequity. I have discussed these concerns in greater detail in Section II.A.

Additionally, factors that allowed fossil and nuclear generating facilities to exceed their initial life spans may not apply to newer, renewable forms of generation. With the pace of technology change, improvements in efficiency, output and availability factors for wind production make it more likely that it will be economical to repower the facilities after 25 years.

Q. What is your recommendation for wind production?

A. My recommendation is to continue to use the current estimate of 25 years for wind production. This is supported by all studies relating to wind generation by Energy industry personnel as presented when the Centennial Wind Farm was constructed by OG&E. It would not be appropriate at this time to increase the life span based on Mr. Garrett's opinion that the plants might be able to last longer, in particular because he has not discussed the outlook for these facilities with OG&E management.

V. MASS PROPERTY SERVICE LIVES

Q. Can you summarize the proposals for mass property service lives?

A. Yes. For mass property service lives, OG&E, Staff and ARVEC have estimated

[21] Direct Testimony of David Garrett, p. 22.

survivor curves to describe the life characteristics for OG&E's plant accounts. Iowa survivor curves are used by each party to estimate or forecast the average service life and retirement dispersion pattern. Each party has also incorporated statistical analyses using the retirement rate method of analysis. However, Ms. Wolfe and Mr. Garrett have reached different conclusions for the service lives of various electric transmission and distribution plant accounts. Because each party has primarily incorporated the same statistical analyses, the differences in estimates are due to different judgments as to how to interpret the historical data and what the best estimates of future life expectations are for each accounts. As I will explain, the judgments Mr. Garrett and Ms. Wolfe 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 Staff and ARVEC?

A. As I have discussed in Section II.B, Mr. Garrett, and to a lesser extent Ms. Wolfe, have not incorporated the proper judgment to ensure their estimates are reasonable. The approach to life estimation involves much more than just mathematical results, and the absence of judgment can produce very unreasonable and unrealistic results. Mr. Garrett in particular has proposed service lives that are for many accounts outside the range of reasonable expectations for the property studied. He appears to have given little, if any, consideration to any factors other than the statistical analysis.

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 an eighteen year period, from 1997 through 2014. Because many of the assets studied have lives of 40 to 50 years (or longer), an eighteen 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 Ms. Wolfe and Mr. Garrett have done, ideally one would want a longer period of data. However, only eighteen years of data are available, and thus factors other than the statistical analysis must be given more consideration.

Q. Can you first address Ms. Wolfe and Mr. Garrett recommendations?

A. Yes. Mr. Garrett's proposals appear to be based on little more than simply selecting mathematical or visual best fitting curves from the statistical analysis. Mr. Garrett's testimony does not reference any factors other than mechanical curve fitting that influenced his recommendations. Indeed, for each of the accounts discussed in the "Detailed Analysis of Selected Accounts" section of his testimony (which begins on page 26), Mr. Garrett's discussion only focuses on the specifics of mechanical curve matching. He does not discuss other factors – such as forces of retirement for the assets in each account, typical estimates for other utilities or Company plans - that should be considered to determine appropriate service life estimates. Mr. Garrett's approach is not 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.

As I have discussed previously, the NARUC Manual is one of the most widely recognized authoritative depreciation texts. Chapter VIII of the NARUC Manual discusses life analysis.

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

A. No. To the contrary, the NARUC Manual specifically states that "depreciation analysts should avoid becoming ensnared in the mechanics of the historical life study and relying solely on mathematical solutions."[22] That is, the NARUC Manual clearly states that service lives should <u>not</u> be estimated in the manner Mr. Garrett and Mr. Andrews have utilized.

The NARUC Manual goes on to explain that "several factors should be considered in estimating property life. Some of these factors are:

1. Observable trends reflected in historical data;
2. Potential changes in the type of property installed;
3. Changes in the physical environment;

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

> 4. Changes in management requirements;
> 5. Changes in government requirements; and
> 6. Obsolescence due to the introduction of new technologies."[23]

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 detail on page 128, explaining that "the use of informed judgment can be a major factor in forecasting." It goes on to explain that:

> 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. Ms. Wolfe and Mr. Garrett 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 results?

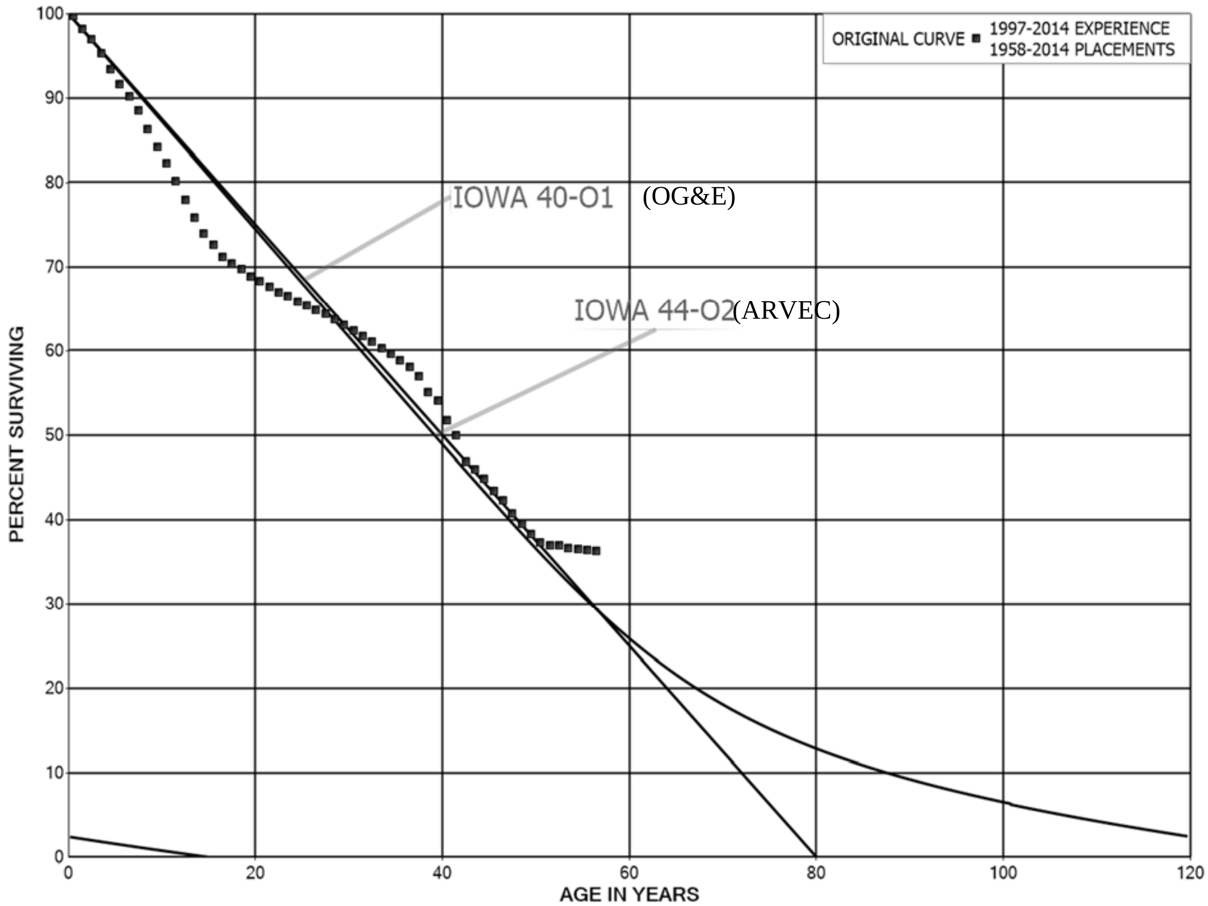
A. Yes. One example is Account 368, Line Transformers. Mr. Garrett's estimate, as well as mine, is shown in Figure 2 below. Mr. Garrett has proposed an average service life of 44 years for this account. In comparing the two curves you can see

[23] NARUC, Public Utility Depreciation Practices, 1996, p. 129

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 56).

However, the two curves differ dramatically after this age. My estimate, the 40-O1, projects that retirements will continue at the same rate as they have through age 56. However, Mr. Garrett's use of the O2 curve negates the fact that future retirements will continue at the same rate. Instead, his estimate assumes that after about age 60 the rate of retirements will slow dramatically. He projects that only about a quarter of the assets in the account will be in service for 60 years, but then inexplicable projects 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. The projection forecast by my estimate - that retirements will continue at a similar rate as in the past - is much more reasonable than that of Mr. Garrett.

Figure 2



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 2, in which a portion of the assets in the account survive much, much longer than the remainder of the account. The lack of judgment in Mr. Garrett's analysis is even more apparent in the fact that the curve I have estimated, the 40-O1, is very similar to his estimate for the ages in which there is representative historical data.

Q. Do ARVEC's estimates for other accounts suffer from the same issues?

A. Yes. ARVEC has used the same inappropriate approach to life estimation for each account. As a result, each of ARVEC's estimates suffer from the same problems as this account.

Q. Can you briefly illustrate a few other accounts that Mr. Garrett has proposed extremely long life characteristics which could not have incorporated any more than mathematical analyses?

A. Yes. I will use Account 353, Station Equipment; 356, Overhead Conductors and Devices; and 362, Station Equipment.

Account 353, Station Equipment, includes assets such as transformers, current breakers, control equipment, regulators, batteries, etc, as the major assets within the account. None of these assets are expected to have an average life longer than 55 years. However, Mr. Garrett estimates a 64-R1 type curve which not only has an average of 64 years but a maximum life for these assets of 130 years. This is not a realistic life characteristic of the full life cycle of the account. Account 362, Station Equipment, represents the same assets as Account 353, but relates to distribution instead of transmission. For this account, Mr. Garrett proposes a 68-R2 type curve. That is an average life of 68 years and maximum life of 120 years. This type of curve implies that 70 percent of the account will last over 55 years and 50 percent will last 70 years. Thus, half the station equipment that directly provides electricity to customers must remain reliable for 70 years. Mr. Garrett also recommends the 68-R2 type curve for Account 356. Once again the life characteristics of a 68-R2 for overhead conductor is not realistic when determining a curve that matches recovery to service life. Part II of the Depreciation Study explains the estimation of survivor curves and an explanation of Iowa curves which have been in use since 1925.

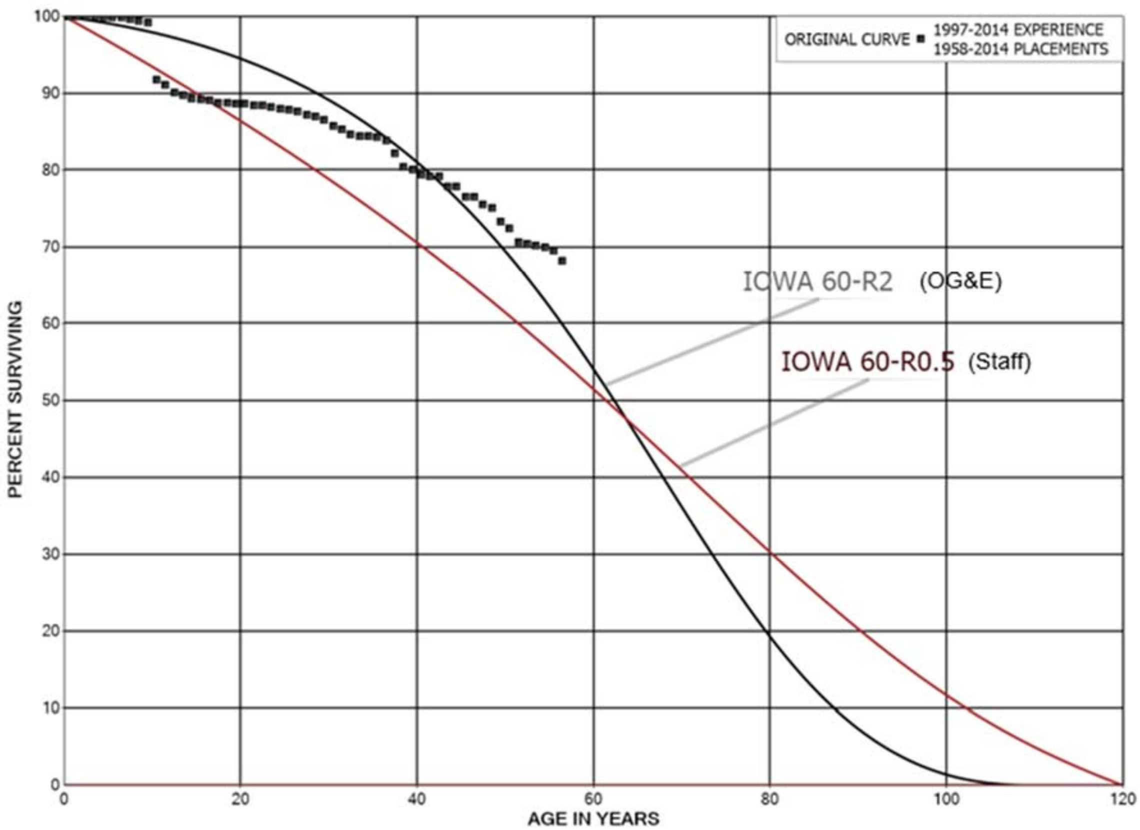
Q. Do Staff's estimates have similar issues to those of ARVEC?

A. Generally, yes. However, I will only address a few accounts that do not represent reasonable life characteristics for the type of assets within the account. These accounts are Transmission Station Equipment, Account 353.0; Transmission Overhead Conductor and Devices, Account 356; and Distribution Meters – Metering Equipment, Account 370.1.

Q. Please describe the differences in life estimate for Account 353.00.

A. My estimate for this account is a 60-R2 survivor curve. Staff has proposed a 60-R0.5 survivor curve. Therefore, both estimates represent an average life of 60 years which is rather long for station equipment at substation. The equipment in this account includes transformers, circuit breakers, electronic controls and relays, batteries, regulators, monitoring equipment, etc. Given that the survivor curve should closely represent the full life cycle of the entire asset class which includes average life, dispersion from age to age and the maximum life, then the full life cycle should be considered when making a recommendation. The 60-R2 survivor curve has an average life of 60 years, an increased percentage of retirements from age 30 to 70 when most assets are retired in this account and a maximum life of 105 years. Staff's 60-R0.5 curve reflects a much higher degree of retirement from age 0 to age 65 with the expectation that 30 percent of the station equipment will last 80 years and some assets will last as long as 120 years. The life characteristics of a 60-R0.5 are not realistic nor would it be appropriate for OG&E to assume 30% of its transmission station equipment would be reliable for at least 80 years. The life characteristics of the two curves as well as the actual data for OG&E is set forth on Figure 3.

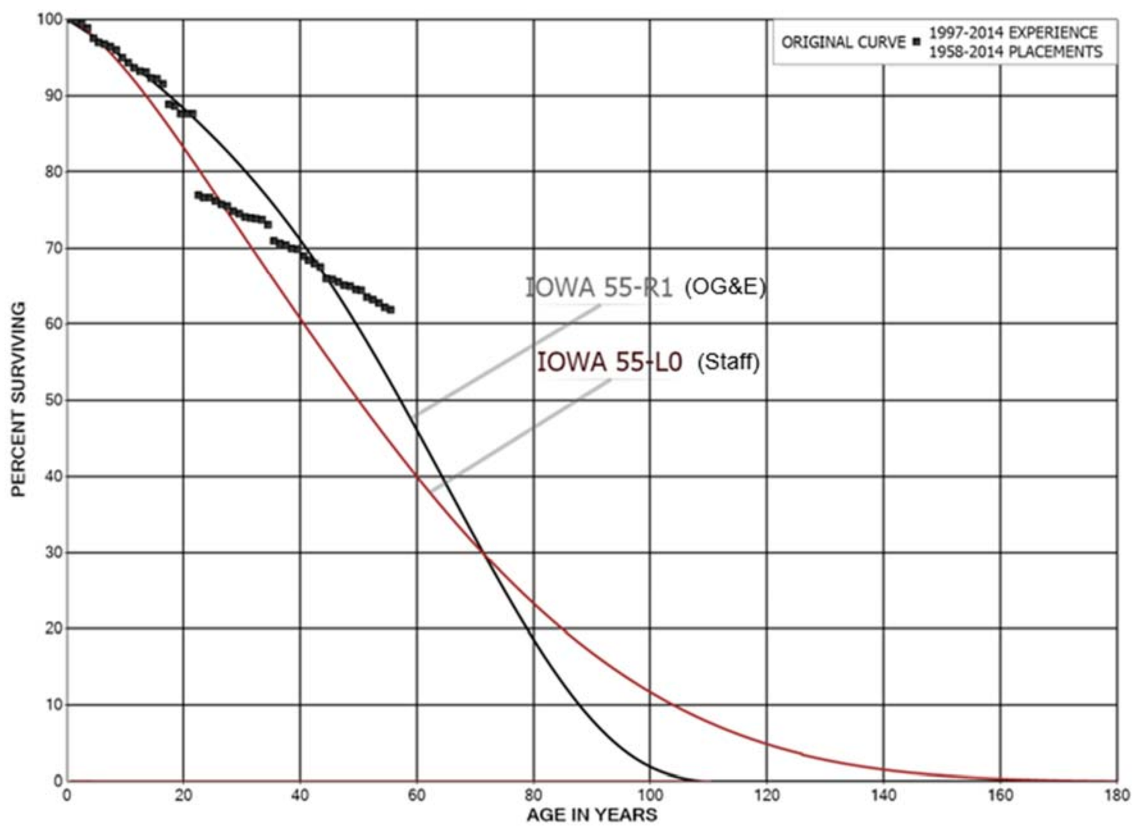
Figure 3



Q. Please describe the differences in life estimate for Account 355.

A. My estimate for this account is a 55-R1 survivor curve. Staff has proposed a 55-L0 survivor curve. Once again, both estimates have the same average life, however, the full life cycles are much different. This account represents transmission poles, crossarms and ground wire. My 55-R1 type curve represents the average life of 55-years and maximum life of 105 years. Staff's 55-L0 type curve has an average life of 55 years but a maximum life of 170 years. The 55-L0 curve assumes that after age 60 the retirement ratio slows down. Therefore, not only is it counter to expect poles to stay in service for 170 years, but it assumes retirement levels to slow down after age 60. Please see figure 4 to compare life estimates.

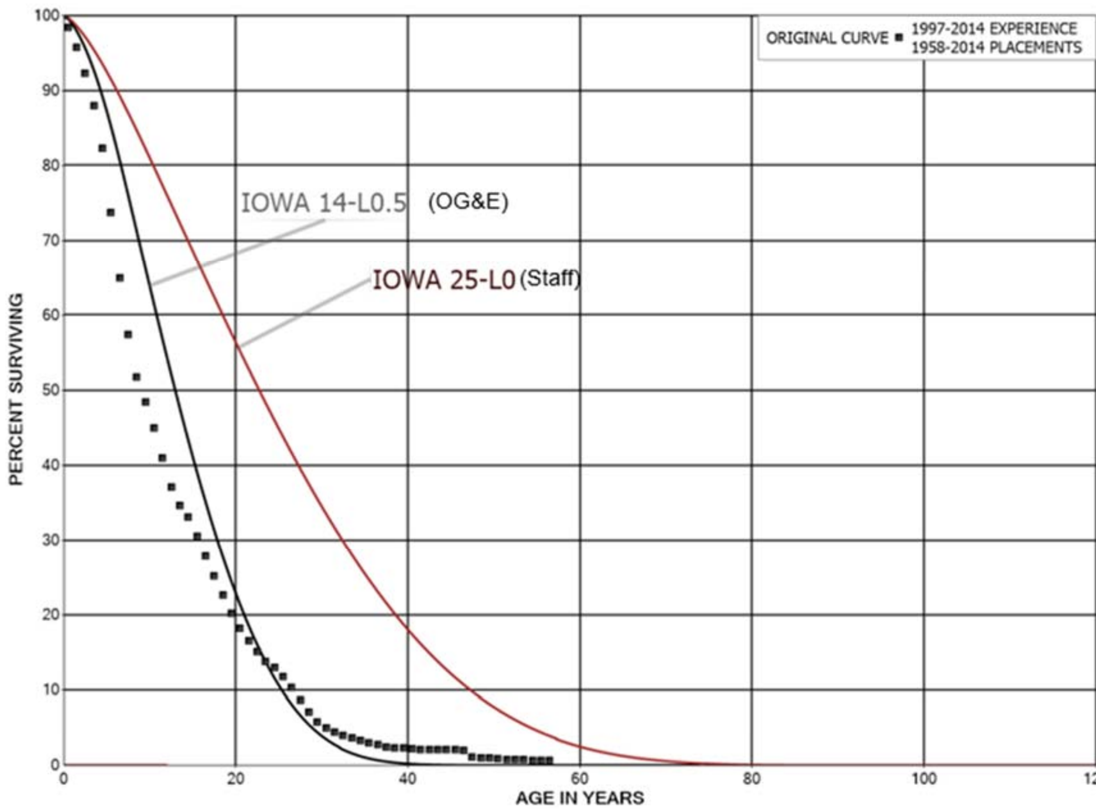
Figure 4



Q. Please describe the difference in life estimates for Account 370.1.

A. My estimate for this account is a 14-L0.5 survivor curve. Staff has proposed a 25-L0 survivor curve. Figure 5 sets forth a comparison of the two survivor curves and the actual life characteristics of this account. My proposed 14-L0.5 curve reflects a close approximation of the life characteristics of metering equipment which we know is in the midst of major technological changes. Staff's 25-year average life and 75 year maximum life does not represent OG&E's experience nor the changes in the asset mix. The 25-year life was more appropriate many years ago.

Figure 5



VI. NET SALVAGE FOR MASS PROPERTY

Q. Has Staff and ARVEC agreed with your net salvage estimates for mass property accounts?

A. ARVEC has agreed with all my mass property net salvage accounts. Staff has agreed with all my mass property net salvage estimates except for Account 356, Overhead Conductors and Devices and Account 365, Overhead Conductors and Devices.

Q. Can you explain the difference in net salvage percentage for Account 356?

A. Yes. I have recommended negative 50 percent net salvage. This is based on statistical analyses for the period 1991 through 2014, Company expectations for future activities, the trends within the industry for net salvage and the estimates of other electric companies. The overall net salvage for the period 1991-2014 is negative 53 percent as shown on page VIII-35 of the Depreciation Study, the most recent 5-year period has been negative 139 percent. Based on the requirements to prepare a site for work, the total cost of removal should be higher than in the past.

In contrast, Ms. Wolfe has added 2015 data to her analyses which was not part of the depreciation study. The inclusion of the additional year provides her reasoning for the negative 39 percent net salvage. However, just performing a statistical analyses without considering all the information is not appropriate and inconsistent with the methodology of all the other accounts. In the case of Account 356, the recorded 2015 retirements are very high as compared to other years and not all of the cost of removal associated with those retirements have been recorded. Therefore, establishing a net salvage percentage solely on the statistics is not appropriate as clearly the trend since 2005 has been considerably more negative.

Q. Is the difference in net salvage estimates for Account 365 due to similar circumstances?

A. Generally, yes. I have estimated negative 50 percent net salvage which is based on all the same factors as discussed in Account 356. The overall period, 1991-2014, is negative 50 percent and the most recent 5-year period has been negative 68 percent. The statistical analyses has shown more negative than 50 percent since 2001.

In contrast, Ms. Wolfe includes the 2015 data and does not segregate the highway reimbursements. Therefore, the gross salvage is considerably higher than my analyses and does not reflect the true net salvage characteristics for all distribution overhead conductor.

VII. DEPRECIATION RATES FOR FUTURE FACILITIES

Q. Please address Ms. Wolfe's discussion of depreciation rates for future facilities on pages 26 through 28 of her testimony.

A. I first note that Ms. Wolfe agrees with my recommended depreciation rates for Sooner Scrubber Unit 1 and Sooner Scrubber Unit 2. She also has recommended similar depreciation rates for Mustang Solar.[24] However, her recommendation for the Activated Carbon Injection (ACI) assets at Muskogee Unit 4 and 5 is incorrect and will not recover the costs of these assets.

Q. What has Ms. Wolfe recommended for the ACI assets?

A. Ms. Wolfe has recommended that the ACI assets use the "same depreciation rate as recommended for the other assets in Account 312."[25]

Q. Please explain why Ms. Wolfe's recommendation is inappropriate.

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[24] She also has not made a recommendation for the Mustang CT facility because the Company's application to construct this facility was withdrawn in Docket No. 16-014-U.

[25] Direct Testimony of Gerrilynn Wolfe, p. 27, lines 6-8.

A. As I explained in Section III, OG&E's power plants are life span property and all assets at the plant should be expected to be retired concurrently upon the final retirement of the plant. For this reason, the average service lives of assets at a power plant will vary depending on the vintage year in which an asset is installed. For example, Muskogee Unit 5 went into service in 1978, has a 65 year life span and is expected to be retired in 2043. Thus, none of the assets at the plant will have a service life that exceeds 65 years. However, newer assets will necessarily have a shorter service life. For example, an asset installed in 2016 will have a maximum service life of 27 years (2043-2016), since the plant is expected to be retired in 2043.

For this reason, it is inappropriate to simply apply the life estimate for the remaining assets in Account 312 to the new ACI assets. For example, Account 312 for Muskogee Unit 5 has a 2.48% depreciation rate. ACI assets installed in 2016 would be in service for no longer than 27 years (and as I will explain will actually be in service for a shorter period of time). If a 2.48% depreciation rate for 27 years, the result is that only about 67% of the cost of these assets would be recovered. Thus, Ms. Wolfe's proposal is deficient in that it guarantees that the costs of these assets will not be recovered while they are in service.

Q. Should the specific ACI assets be expected to remain in service for the remaining life span of Muskogee Units 4 and 5?

A. No. Based on information provided by OG&E, these assets are expected to be replaced after three years. That is, they will be retired long before the end of the life of the overall power plants. Thus, the actual service life that should be used for ACI assets is three years, which results in the 33.33% depreciation rate I have proposed. Ms. Wolfe's proposal would not recover these costs until long after the ACI assets are replaced, and even beyond the end of the life of the entire facility. For these reasons, her recommendation for ACI assets is inappropriate.

VIII. AMORIZATION OF ELECTRIC PLANT – SOFTWARE

Q. What is the issue in this section of your testimony?

A. This section discusses Mr. Garrett's proposal to use a 15 year life for all software assets.

Q. What have you proposed for Account 303.2 Miscellaneous Intangible Plant - Software?

A. For this account I have proposed to continue to use the currently approved 10 year life for Account 303. I should note that 10 years is established as an average life for the assets in the account. Some software applications, such as enterprise systems may last longer, whereas many assets will have shorter lives. Further, enhancements to larger software applications will not have as long of lives as the original software project.

Q. What have other parties proposed?

A. Staff has not recommended a change to the life for Account 303.2. ARVEC has recommended 15 year lives. As support, ARVEC references that some software may have longer lives than 10 years, while ignoring the fact that many software applications will have shorter lives.

Q. Please address the arguments set forth by Mr. Garrett for this account.

A. Mr. Garrett bases his arguments on the discussion of certain software projects that could last longer than 10 years. However, this arguments is asymmetric in nature

– Mr. Garrett discusses software with longer lives but ignores the impact for software with shorter lives. As with any technology, computer software advances quickly, and as such most types of software applications will have lives that are shorter than 10 years.

The various comments made by Mr. Garrett tend to disregard the fact that the 10 year life for this account is an average. While some assets may have longer lives, many will have shorter lives. Further, Mr. Garrett's discussion misses the more important question – namely, the appropriate average life for computer software. On its face, a 15 year average service life for all computer software is a very long life. Most software applications will have much shorter lives. A 10 year life, which is currently approved for this account, is much more appropriate and consistent with the Company's expectations for the actual assets in this account.

Q. Mr. Garrett cites that Florida Power and Light ("FPL") uses a 20 year life for some software assets. Does this support his recommended 15 year life?

A. No. The 20 year life cited by Mr. Garrett is only for a single software application. Most of FPL's software applications have a 5 year life, and therefore the overall average life for FPL's software would less than 20 years.

Q. Is the discussion of Bonbright you provided in Section II.A of your rebuttal testimony particularly applicable to this account?

A. Yes. Software is an asset for which technology changes rapidly. The assets in this account are therefore subject to obsolescence, as well as the possibility that vendors will no longer support applications as they age. This concept supports favoring a shorter service life over a longer service life.

Further, new applications often bring enhanced functionality that allow for the better management of the Company's assets and improved customer service and reliability. Bonbright's concern that too long of a life could incent a Company to not make investments in new technology is therefore particularly relevant to this account. All of these factors support that an artificially long service life, such as proposed by Mr. Garrett, would not be appropriate for this account.

Q. Does this conclude your testimony?

A. Yes.