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Reply to: Reno

September 23, 2016

Breanne Potter
Assistant Commission Secretary
Public Utilities Commission of Nevada
1150 East Williams Street
Carson City, Nevada 89701

Re: Docket No. 16-06008; PreFiled Testimony of David J. Garrett

Dear Ms. Potter:

Please accept for filing in the above-referenced docket the attached PreFiled Testimony of David J. Garrett

Should you have any questions or concerns regarding this submission, please contact me directly at 775-326-4369.

Sincerely,

McDONALD CARANO WILSON LLP

Kathleen M. Drakulich

KMD/ajb
Enclosure (as stated)

BEFORE THE PUBLIC UTILITIES COMMISSION OF NEVADA

Sierra Pacific Power Company
d/b/a NV Energy
Electric Department

Docket No. 16-06008

PreFiled Responsive Testimony of
David J. Garrett

on behalf of the
Northern Nevada Utility Customers

September 23, 2016

TABLE OF CONTENTS

INTRODUCTION 7
EXECUTIVE SUMMARY 8
LEGAL STANDARDS 9
ANALYTIC METHODS 11
LIFE SPAN PROPERTY ANALYSIS 13
- Interim Retirement Analysis 14
- Weighted Net Salvage Analysis 16
- Probable Life Span of Tracy Units 8, 9, and 10 18

MASS PROPERTY ANALYSIS 22
- Service Life Estimates 23
- Analysis of Material Accounts 25
  - Account 355 – Transmission Poles and Fixtures 26
  - Account 356 – Transmission Overhead Conductors and Devices 28
  - Account 361 – Distribution Structures and Improvements 30
  - Account 364 – Distribution Poles, Towers, and Fixtures 32
  - Account 367 – Distribution Underground Conductors and Devices 34
  - Account 368 – Distribution Transformers 41
  - Account 369 – Distribution Services 42
  - Account 303 – Software 44
- Mass Salvage Analysis 47
  - Account 355 – Transmission Poles and Fixtures 47
  - Account 356 – Transmission Overhead Conductors and Devices 48
  - Account 364 – Distribution Poles, Towers, and Fixtures 49
  - Account 365 – Distribution Overhead Conductors and Devices 50

CALCULATED ACCUMULATED DEPRECIATION 50
CONCLUSION AND RECOMMENDATION 52

APPENDICES

APPENDIX A: THE DEPRECIATION SYSTEM 55

APPENDIX B: IOWA CURVES 62

APPENDIX C: ACTUARIAL ANALYSIS 75

List of Exhibits

Exhibit DJG 1	Curriculum Vitae
Exhibit DJG 2	Summary Adjustment
Exhibit DJG 3	Detailed Adjustment
Exhibit DJG 4	Detailed Rate Comparison
Exhibit DJG 5	Depreciation Rate Development
Exhibit DJG 6	Account 355 Curve Fitting
Exhibit DJG 7	Account 356 Curve Fitting
Exhibit DJG 8	Account 361 Curve Fitting
Exhibit DJG 9	Account 364 Curve Fitting
Exhibit DJG 10	Account 367 Curve Fitting
Exhibit DJG 11	Account 368 Curve Fitting
Exhibit DJG 12	Account 369 Curve Fitting
Exhibit DJG 13	Account 303 – Software (Intangible) Rate Calculation
Exhibit DJG 14	Account 303 – Software (Common) Rate Calculation
Exhibit DJG 15	Remaining Life Development
Exhibit DJG 16	Iowa Curve Fitting

LIST OF FIGURES

Figure 1:	Depreciation Rate Comparison and Adjustment by Plant Function	8
Figure 2:	Account 315 – Accessory Electric Equipment	15
Figure 3:	Account 355 – Poles and Fixtures	27
Figure 4:	Account 356 – Overhead Conductors and Devices	29
Figure 5:	Account 361 – Structures and Improvements	31
Figure 6:	Account 364 – Poles, Towers, and Fixtures	33
Figure 7:	Account 367 – OLT Curve Only	35
Figure 8:	Account 367 – Portion of Observed Life Table	36
Figure 9:	Account 367 – Entire OLT Curve with Selected Iowa Curves	38
Figure 10:	Account 367 – Underground Conductors and Devices	40
Figure 11:	Account 368 – Transformers	41
Figure 12:	Account 369 – Services	43
Figure 13:	The Depreciation System Cube	56
Figure 14:	Modal Age Illustration	66
Figure 15:	Type L Survivor and Frequency Curves	68
Figure 16:	Type S Survivor and Frequency Curves	69
Figure 17:	Type R Survivor and Frequency Curves	70
Figure 18:	Iowa Curve Derivations	73
Figure 19:	Forces of Retirement	75
Figure 20:	Exposure Matrix	77
Figure 21:	Retirement Matrix	78
Figure 22:	Observed Life Table	80
Figure 23:	Original “Stub” Survivor Curve	81
Figure 24:	Placement Bands	83
Figure 25:	Experience Bands	84
Figure 26:	Visual Curve Fitting	87
Figure 27:	Mathematical Fitting	89

List of Equations

Equation 1: Straight-Line Accrual 57

Equation 2: Straight-Line Rate 57

Equation 3: Remaining Life Accrual 60

Equation 4: Average Life 71

Equation 5: Average Remaining Life 72

INTRODUCTION

Q1. State your name and occupation.

A1. My name is David J. Garrett. I am a consultant specializing in public utility regulation. I am the managing member of Resolve Utility Consulting. I focus my practice on the primary capital recovery mechanisms for public utility companies: cost of capital and depreciation.

Q2. Summarize your educational background and professional experience.

A2. I received a B.B.A. degree with a major in Finance, an M.B.A. degree, and a Juris Doctor degree from the University of Oklahoma. I worked in private legal practice for several years before accepting a position as assistant general counsel at the Oklahoma Corporation Commission in 2011. At the Commission, I worked in the Office of General Counsel in regulatory proceedings. In 2012, I began working for the Public Utility Division as a regulatory analyst providing testimony in regulatory proceedings. I am a Certified Depreciation Professional through the Society of Depreciation Professionals. I am also a Certified Rate of Return Analyst through the Society of Utility and Regulatory Financial Analysts. A more complete description of my qualifications and regulatory experience is included in my curriculum vitae.[1]

Q3. On whose behalf are you testifying in this proceeding?

A3. I am testifying on behalf of the Northern Nevada Utility Customers ("NNUC").

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[1] Exhibit DJG 1.

Q4. Describe the purpose and scope of your testimony in this proceeding.

A4. I am responding to the depreciation study conducted by Gannett Fleming on the depreciable assets of Sierra Pacific Power Company d/b/a NV Energy ("Sierra" or the "Company"). The depreciation study is sponsored by Mr. Ned W. Allis.

EXECUTIVE SUMMARY

Q5. Summarize the key points of your testimony.

A5. In the context of utility ratemaking, "depreciation" refers to a cost allocation system designed to measure the rate by which a utility may recover its capital investments in a systematic and rational manner. I employed a well-established depreciation system and used actuarial analysis to statistically analyze the Company's depreciable assets in order to develop reasonable depreciation rates in this case. The table below compares NNUC's proposed rates to SPPC's proposed rates by plant function.[2]

Figure 1:
Depreciation Rate Comparison and Adjustment by Plant Function

Plant Function	Original Cost 5/31/2016	SPPC Proposal		NNUC Proposal		NNUC Adjustment
		Rate	Accrual	Rate	Accrual	
Intangible Plant	$ 27,080,767	10.0%	$ 2,707,000	1.9%	$ 509,735	$ (2,197,265)
Steam Production	540,758,017	4.8%	25,903,967	4.8%	25,903,967	-
Other Production	597,161,843	3.7%	22,049,785	3.1%	18,758,064	(3,094,448)
Transmission	725,151,493	1.9%	14,018,520	1.7%	12,074,638	(1,435,596)
Distribution	1,401,671,198	2.3%	31,766,075	1.9%	25,963,707	(5,802,367)
General	102,069,787	6.2%	6,376,477	6.2%	6,360,750	(14,680)
Common	217,033,331	7.3%	15,864,411	3.9%	8,445,095	(6,925,635)
Total	$3,610,926,436	3.29%	$ 118,686,234	2.71%	$ 98,015,956	**$ (19,469,991)**

The depreciation accruals shown in this table were calculated based on the original cost of plant as of May 31, 2016. NNUC's total adjustment for the Nevada jurisdiction reduces

[2] *See also* Exhibits DJG 2 and DJG 3.

the Company's proposed depreciation expense by about $19.5 million, as shown in the far right column of Figure 1.

Q6. Summarize the primary factors driving NNUC's adjustment.

A6. There are three primary factors driving NNUC's adjustment in this case: 1) extending the probable life spans of Tracy Units 8, 9, and 10 from 35 years to 45 years which accounts for about $3.1 million of the total NNUC Adjustment in Figure 1; 2) using better-fitting Iowa curves on the transmission and distribution accounts which accounts for about $7.2 million of the total NNUC Adjustment in Figure 1; and 3) extending the average life of the Company's software systems to 15 years which accounts for about $9.1 million of the total NNUC Adjustment in Figure 1.

LEGAL STANDARDS

Q7. Discuss the standard by which regulated utilities are allowed to recover depreciation expense.

A7. In *Lindheimer v. Illinois Bell Telephone Co.*, the U.S. Supreme Court stated that "depreciation is the loss, not restored by current maintenance, which is due to all the factors causing the ultimate retirement of the property. These factors embrace wear and tear, decay, inadequacy, and obsolescence."[3] The *Lindheimer* Court also recognized that the original cost of plant assets, rather than present value or some other measure, is the proper basis for calculating depreciation expense.[4] Moreover, the *Lindheimer* Court found:

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[3] *Lindheimer v. Illinois Bell Tel. Co.*, 292 U.S. 151, 167 (1934).

[4] *Id.* (Referring to the straight-line method, the *Lindheimer* Court stated that "[a]ccording to the principle of this accounting practice, the loss is computed upon the actual cost of the property as entered upon the books, less the expected salvage, and the amount charged each year is one year's pro rata share of the total amount."). The original cost standard was reaffirmed by the Court in *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591, 606 (1944). The *Hope* Court stated: "Moreover, this Court recognized in [*Lindheimer*], supra, the propriety of basing

> [T]he company has the burden of making a convincing showing that the amounts it has charged to operating expenses for depreciation have not been excessive. That burden is not sustained by proof that its general accounting system has been correct. The calculations are mathematical, but the predictions underlying them are essentially matters of opinion.[5]

Thus, the Commission must ultimately determine if the Company has met its burden of proof by making a convincing showing that its proposed depreciation rates are not excessive.

Q8. Should depreciation represent an allocated cost of capital to operation, rather than a mechanism to determine loss of value.

A8. Yes. While the *Lindheimer* case and other early literature recognized depreciation as a necessary expense, the language indicated that depreciation was primarily a mechanism to determine loss of value.[6] Adoption of this "value concept" would require annual appraisals of extensive utility plant, and is thus not practical in this context. Rather, the "cost allocation concept" recognizes that depreciation is a cost of providing service, and that in addition to receiving a "return on" invested capital through the allowed rate of return, a utility should also receive a "return of" its invested capital in the form of recovered depreciation expense. The cost allocation concept also satisfies several fundamental accounting principles, including verifiability, neutrality, and the matching principle.[7] The definition of "depreciation accounting" published by the American Institute of Certified Public Accountants ("AICPA") properly reflects the cost allocation concept:

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annual depreciation on cost. By such a procedure the utility is made whole and the integrity of its investment maintained. No more is required."

[5] *Id.* at 169.

[6] *See* Frank K. Wolf & W. Chester Fitch, *Depreciation Systems* 71 (Iowa State University Press 1994).

[7] National Association of Regulatory Utility Commissioners, *Public Utility Depreciation Practices* 12 (NARUC 1996).

> Depreciation accounting is a system of accounting that aims to distribute cost or other basic value of tangible capital assets, less salvage (if any), over the estimated useful life of the unit (which may be a group of assets) in a systematic and rational manner. It is a process of allocation, not of valuation.[8]

Thus, the concept of depreciation as "the allocation of cost has proven to be the most useful and most widely used concept."[9]

ANALYTIC METHODS

Q9. Discuss the definition and purpose of a depreciation system, as well as the depreciation system you employed for this project.

A9. The legal standards set forth above do not mandate a specific procedure for conducting depreciation analysis. Nonetheless, depreciation analysts must use a system for estimating depreciation rates that will result in the "systematic and rational" allocation of capital recovery for the utility. Over the years, analysts have developed "depreciation systems" designed to analyze grouped property in accordance with this standard. A depreciation system may be defined by four primary parameters: 1) a method of allocation; 2) a procedure for applying the method of allocation; 3) a technique of applying the depreciation rate; and 4) a model for analyzing the characteristics of vintage property groups.[10] In this case, I used the straight line method, the average life procedure, the remaining life technique, and the broad group model; this system would be denoted as an "SL-AL-RL-BG" system. This depreciation system conforms to the legal standards set forth above, and is commonly used by depreciation analysts in regulatory proceedings. The

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[8] American Institute of Accountants, *Accounting Terminology Bulletins Number 1: Review and Résumé* 25 (American Institute of Accountants 1953).

[9] Wolf *supra* n. 6, at 73.

[10] *See* Wolf *supra* n. 6, at 70, 140.

Company used a very similar approach in this case. I provide a more detailed discussion of depreciation system parameters, theories, and equations in Appendix A.

Q10. Generally describe the actuarial process you used to analyze the Company's depreciable property.

A10. The study of retirement patterns of industrial property is derived from the actuarial process used to study human mortality. Just as actuaries study historical human mortality data in order to predict how long a group of people will live, depreciation analysts study historical plant data in order to estimate the average lives of property groups. The most common actuarial method used by depreciation analysts is called the "retirement rate method." In the retirement rate method, original property data, including additions, retirements, transfers, and other transactions, are organized by vintage and transaction year.[11] The retirement rate method is ultimately used to develop an "observed life table," ("OLT") which shows the percentage of property surviving at each age interval. This pattern of property retirement is described as a "survivor curve." The survivor curve derived from the observed life table, however, must be fitted and smoothed with a complete curve in order to determine the ultimate average life of the group.[12] The most widely used survivor curves for this curve fitting process were developed at Iowa State University in the early 1900s and are commonly known as the "Iowa curves."[13] A more detailed explanation of

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[11] The "vintage" year refers to the year that a group of property was placed in service (aka "placement" year). The "transaction" year refers to the accounting year in which a property transaction occurred, such as an addition, retirement, or transfer (aka "experience" year).

[12] See Appendix C for a more detailed discussion of the actuarial analysis used to determine the average lives of grouped industrial property.

[13] *See* Appendix B for a more detailed discussion of the Iowa curves.

how the Iowa curves are used in the actuarial analysis of depreciable property is set forth in Appendix C, pages 77-91.

Q11. Describe the Company's depreciable assets in this case.

A11. The Company's depreciable assets can be divided into two main groups: life span property (i.e., production plant) and mass property (i.e., transmission and distribution plant). The analytical process is slightly different for each type of property, as discussed further below.

LIFE SPAN PROPERTY ANALYSIS

Q12. Describe the approach to analyzing life span property.

A12. For life span property, there are essentially three steps to the analytical process. First, I reviewed the Company's proposed life spans for each of its production units and compared them life span estimates of other similar production units in other jurisdictions. Second, I examined the Company's proposed interim retirement curves for each account in order to assess the remaining lives and depreciation rates for each production unit. Finally, I analyzed the weighted net salvage for each account, which involved reviewing the Company's weighting of interim and terminal retirements for each production account as well as analyzing the Company's proposed interim and terminal net salvage rates.

Q13. Describe life span property.

A13. The Company's depreciable property could be divided into two main groups: life span property and mass property. "Life span" property accounts usually consist of property within a production plant. The assets within a production plant will be retired concurrently at the time the plant is retired, regardless of their individual ages or remaining economic lives. For example, a production plant will contain property from several accounts, such as structures, fuel holders, and generators. When the plant is ultimately retired, all of the property associated with the plant will be retired together, regardless of the age of each individual unit. Analysts often use the analogy of a car to explain the treatment of life span property. Throughout the life of a car, the owner will retire and replace various components, such as tires, belts, and brakes. When the car reaches the end of its useful life and is finally retired, all of the car's individual components are retired together. Some of the components may still have some useful life remaining, but they are nonetheless retired along with the car. Thus, the various accounts of life span property are scheduled to retire as of the unit's probable retirement date.

Interim Retirement Analysis

Q14. Discuss the concept of interim retirements.

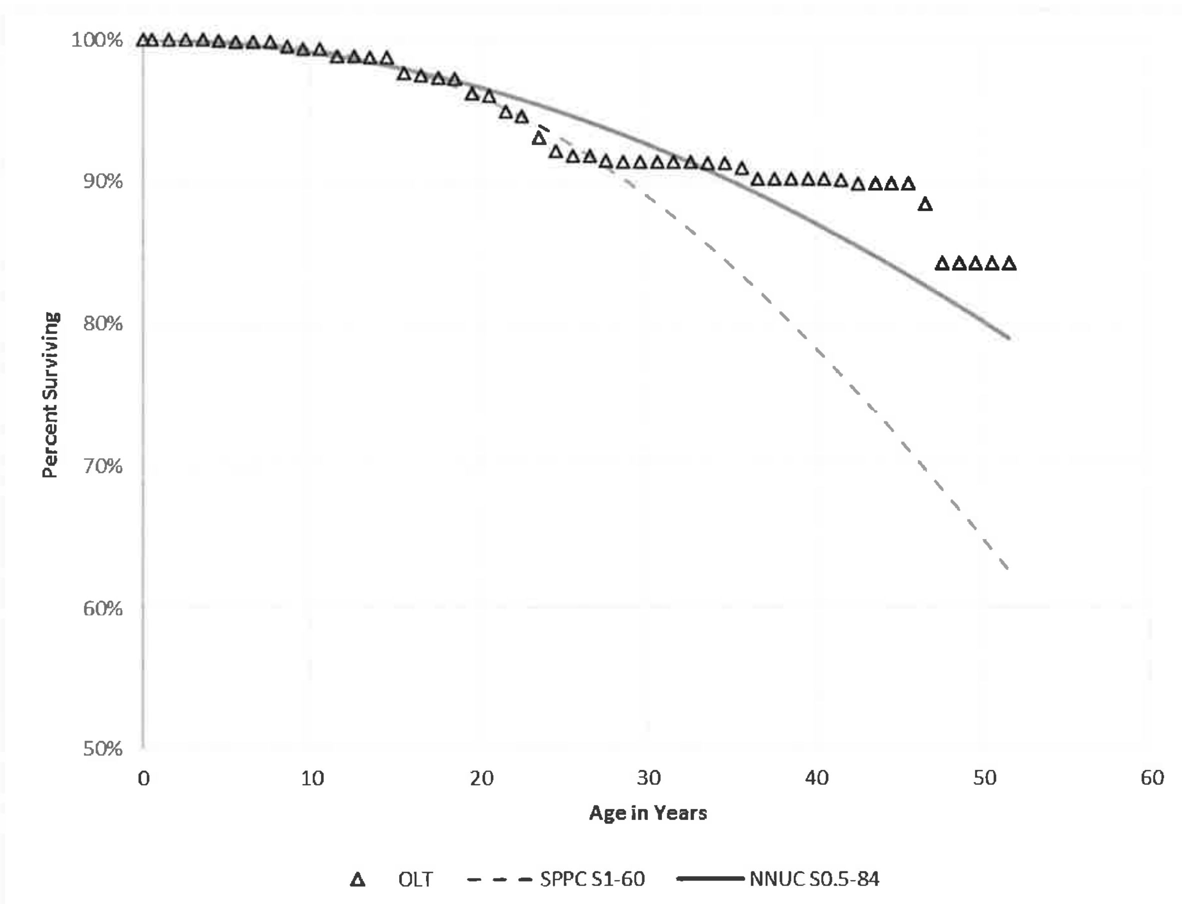
A14. The individual components within a generating unit are retired and replaced throughout the life of the unit. This retirement rate is measured by "interim" survivor curves. Thus, a production plant's remaining life and depreciation rate are not only affected by the terminal retirement date of the entire plant, but also by the retirement rate of the plant's individual components, which are retired during the "interim" of the plant's useful life.

Q15. Did you make any adjustments to the Company's proposed interim retirement curves?

A15. No. Although I did not propose any adjustments to the Company's proposed interim retirement curves, some of the Company's curves were unreasonably short. For example, the Company selected an S1-60 Iowa curve for Account 315 – Accessory Electric Equipment. This account includes auxiliary generators, conversion equipment, and equipment used in connection with the control and switching of electric energy. The S1-

60 curve is unreasonably short in consideration of the Company's actual observed retirement data. Arguably, a better choice would have been the S0.5-84 curve. As shown in the figure below, the S0.5-84 curve provides a better fit to the observed data from the Company's original life table ("OLT").

Figure 2:
Account 315 – Accessory Electric Equipment



If the Company had selected the S0.5-84 curve for this account it would have resulted in fewer interim retirements, a longer composite remaining life, and a lower depreciation expense.

Q16. Why did you not make an adjustment to the Company's proposed interim retirement curve for Account 315?

A16. I am not recommending an adjustment to the Company's use of the S1-60 Iowa curve for Account 315 in lieu of the S0.5-84 curve because the adjustment would not materially impact the depreciation rates that I propose in this case. However, I have included this discussion in the testimony because it follows the general theme that I present in this case regarding the Company's approach to depreciation, namely that the Company should have selected longer and more reasonable survivor curves but instead chose a path that escalates the depreciation costs beyond what is reasonable.

Weighted Net Salvage Analysis

Q17. Did you analyze the Company's estimated proportions of interim and terminal retirements for each production account?

A17. Yes. Calculating weighted net salvage for production accounts involves determining which portion of future retirements will be retired during the interim life of the production plant and which portion will be "terminal" retirements at the end of the plant's life. Once separate net salvage rates are applied to the interim and terminal retirements, weighted net salvage rates can be calculated for each account. I analyzed the amount of interim and terminal retirements the Company estimated for each account according to the corresponding interim Iowa curve selected for each account.

Q18. Describe the Company's approach to estimating terminal net salvage rates for the production accounts.

A18. Yes. The Company's terminal retirements for each production unit are based on a decommissioning study performed by the URS Corporation and filed in Docket No. 13-

06004.[14] The Company did not perform an updated decommissioning study to support the decommission cost estimates in this case, but instead simply escalated the costs from the prior study by 3.02%.[15]

Q19. Does the Company's approach result in terminal decommissioning cost estimates that are likely too high?

A19. Yes. There are several problems with the Company's decommissioning cost estimates in this case. First, the Company has applied a 3.02% increase to all of the costs associated with decommissioning, including material and labor. Not every cost associated with decommissioning has necessarily increased over the past three years, and the Company has not provided adequate support for these cost increases. Furthermore, it appears that the Company did not account for any corresponding increases in scrap value over the past three years, which would have reduced net decommissioning costs. The Company contends it is preferable to escalate all of the decommissioning costs from the prior study rather than performing an updated study.[16] However, in doing so the Company should have taken a more conservative approach in estimating these costs, accounted for the increases in scrap value, and provided more support for the cost-escalation factor.

Q20. Are you recommending any adjustments to net salvage rates for any production accounts?

A20. No. While the amount of interim retirements would have changed if the Company had selected longer, and arguably more reasonable interim retirement curves as discussed

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[14] Direct Testimony of Ellen Y. Fincher p. 4, lines 17-19.

[15] Exhibit Fincher-Direct-2.

[16] Direct Testimony of Ellen Y. Fincher p. 4, line 19.

above, I am not proposing any recommendations to the weighting of interim and terminal retirements. Furthermore, it is very likely that the Company has overestimated terminal net salvage by overestimating decommissioning costs as discussed above. Nonetheless, I am not recommending any adjustments to the proposed net salvage rates for the production accounts for the same reason that I did not recommend adjustments to the Company's proposed interim retirement curves as discussed in QA 16 above. That is, the adjustments would not materially impact the depreciation rates that I propose in this case. However, I have included this discussion in the testimony because it is yet another example of how the Company's approach to depreciation tends to result in unreasonably high depreciation rates.

Probable Life Span of Tracy Units 8, 9, and 10

Q21. Describe Tracy Units 8, 9, and 10 and the Company's proposed lifespan for this plant.

A21. Tracy Units 8, 9, and 10 comprise a 2 x 1, 541-MW combined cycle plant that was installed in 2008. It is the latest addition to the Company's generating fleet.[17] Currently, the Tracy combined cycle plant has an estimated retirement date of 2043, and an estimated life span of 35 years.[18]

[17] Docket No. 16-06006, Direct Testimony of Kevin C. Geraghty, p. 4, lines 25-26.

[18] 2016 Depreciation Study for Sierra's electric plant, p. III-5.

Q22. Historically, has there been a tendency to significantly underestimate the lives of generating plants when they are relatively new?

A22. Yes. For example, most of the coal plants in the U.S. were built before 1980.[19] Early life span estimates for these plants were as short as 25 years. Currently however, about 75% of all coal-fired plants are at least 30 years old.[20] Moreover, the average retirement age of coal plants in 2015 was 58 years.[21] This is not surprising. According to Gannett Fleming, "typical life spans for base load, steam power plants are 50 to 65 years."[22] This means that many of the original life span estimates for coal plants were grossly underestimated. We've seen similar tendencies with other production technology, such as wind generating units. Some early estimates for the lifespan of wind units were as short as 10 years.[23] Now it is not uncommon to see life span estimates of more than twice that amount for wind units.[24] Likewise, early estimates for nuclear power plants were around 40 years.[25] Now, out of the 100 U.S. nuclear reactors in the U.S., "81 have completed their first license renewal, which adds 20 years to their initial 40-year operating license to take them out to 60 years."[26]

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[19] Todd Woody, "Hitting the Gas: Most Coal-fired Power Plants in the U.S. are Nearing Retirement Age," http://qz.com/61423/coal-fired-power-plants-near-retirement/ (last accessed 9-21-16).

[20] *Id.*

[21] Jack Fitzpatrick, "Coal Plants Are Shutting Down, With or Without Clean Power Plan," https://morningconsult.com/2016/05/03/coal-plants-shutting-without-clean-power-plan/, *Morning Consult*, May 3, 2016 (last accessed 9-21-16).

[22] Application of El Paso Electric Company to Change Rates, SOAH Docket No. 473-15-5257; PUC Docket No. 449412014, Depreciation Study for El Paso Electric Company, p. III-6, sponsored by John Spanos of Gannett Fleming.

[23] Maxine Myers, *New Research Blows Away Claims that Aging Wind Farms are a Bad Investment* (Imperial College London 2014), http://www3.imperial.ac.uk/newsandeventspggrp/imperialcollege/newssummary/news_20-2-2014-9-18-49.

[24] *Id.*

[25] Paul Voosen, "How Long Can a Nuclear Reactor Last?: Industry Experts Argue Old Reactors Could Last Another 50 Years, or More," http://www.scientificamerican.com/article/nuclear-power-plant-aging-reactor-replacement-/ *Scientific American*, November 20, 2009 (last accessed 9-21-16).

[26] Rebecca Kern, "Maintenance is Key to Nuclear Plants Lasting 80 Years," http://www.bna.com/maintenance-key-nuclear-n57982074391/, *Bloomberg*, June 20, 2016 (last accessed 9-21-16).

In fact, Exelon Corp. and Dominion Resources Inc. currently plan additional license renewals to keep their nuclear plants operating up to 80 years.[27] It would not be surprising to see a similar trend with combined cycle plants.

Q23. Has Gannett Fleming adopted life spans for combined cycle units of 45 years or more?

A23. Yes. In a recent depreciation study performed by Gannett Fleming for El Paso Electric Company, Gannett Fleming adopted a 52-year life span for a combined cycle plant unit.[28] El Paso's combined cycle unit was installed only one year after the Tracy combined cycle unit, and has a probable retirement date of 2061. Similarly in Oklahoma, Gannett Fleming adopted a life span of 45 years for a combined cycle plant owned by Oklahoma Gas & Electric Company.[29]

Q24. When the lifespan of a generating unit is underestimated, does it impose an unfair burden on current ratepayers?

A24. Yes. When the lifespan of a generating unit is underestimated in the early stages of its service life, it creates an artificially short remaining life calculation which overstates depreciation expense. This means that in all of the above examples regarding coal, wind, and nuclear generating units, early ratepayers paid a disproportionately higher portion of the plant's original cost – effectively subsidizing future ratepayers.

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[27] *Id.*

[28] Application of El Paso Electric Company to Change Rates, SOAH Docket No. 473-15-5257; PUC Docket No. 449412014, Depreciation Study for El Paso Electric Company, p. III-6, sponsored by John Spanos of Gannett Fleming (adopting 52-year life span for the Newman #5 combined cycle plant).

[29] Application of Oklahoma Gas and Electric Company to Modify its Rates, Cause No. PUD 201500273, 2014 Depreciation Study for OG&E, p. III-7, sponsored by John Spanos of Gannett Fleming (adopting a 45-year life span for the Red Bud combined cycle plant).

Q25. If the Commission allows the Company to recover its plant investments at an artificially fast rate, can this incentivize economic inefficiencies?

A25. Yes. Unlike competitive firms, regulated utility companies are not always incentivized by natural market forces to make the most economically efficient decisions. An obvious example of this fact can be seen in utility companies' very low debt ratios. While competitive firms have a natural incentive to issue sufficient amounts of low-cost debt in order to minimize their weighted average cost of capital, utilities are not incentivized in the same manner under the rate-base rate of return model, which results in inflated capital costs for utilities.[30] A key role of a regulatory commission is to act as a surrogate for competition and to replicate the natural forces experienced in the competitive marketplace. If a utility is allowed to recover the cost of its capital assets long before they actually retire, this could incentivize the utility to increase rate base by retiring assets before the end of their economic useful lives, which results in economic waste. Thus, when there is evidence, as there is here, that a plant's lifespan is underestimated, it is important for the Commission to adjust the plant's estimated service life to more accurately reflect its probable lifespan.

Q26. Is the Company harmed if useful lives are overestimated?

A26. No. The process of depreciation strives for a perfect match between actual and estimated useful life. When these estimates are not exact, however, it is better that useful life is overestimated rather than underestimated. In the unlikely event a plant's lifespan were overestimated, there are a variety of measures that regulators can use to ensure the utility is not financially harmed. One such measure would be the use of a regulatory asset account.

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[30] Application of Oklahoma Gas and Electric Company to Modify its Rates, Cause No. PUD 201500273, Responsive Testimony of David J. Garrett, pp. 79-85.

Q27. What is your recommendation regarding the lifespan of the Tracy combined cycle plants?

A27. For all of the reasons discussed above, I recommend that the lifespan of Tracy Units 8, 9, and 10 be extended by 10 years. This corresponds to an overall lifespan of 45 years and probable retirement date of 2053. While this combined cycle unit will likely last longer than 45 years, this recommendation provides a conservative approach to a more accurate lifespan estimate. With coal, wind, and nuclear generation, we can see now that the initial lifespan estimates were far too short. Thus, it is not surprising that firms like Gannett Fleming have already adopted lifespans of up to 52 years for newer combined cycle units in other states.[31]

MASS PROPERTY ANALYSIS

Q28. Describe mass property.

A28. Unlike life span property accounts, "mass" property accounts usually contain a large number of small units that will not be retired concurrently. For example, poles, conductors, transformers, and other transmission and distribution plant are usually classified as mass property. Estimating the service life of any single unit contained in a mass account would not require any actuarial analysis or curve-fitting techniques. Since we must develop a single rate for an entire group of assets, however, actuarial analysis is required to calculate the average remaining life of the group.

[31] Application of El Paso Electric Company to Change Rates, SOAH Docket No. 473-15-5257; PUC Docket No. 449412014, Depreciation Study for El Paso Electric Company, p. III-6, sponsored by John Spanos of Gannett Fleming (adopting 52-year life span for the Newman #5 combined cycle plant).

Q29. How did you determine the depreciation rates for the mass property accounts?

A29. To develop depreciation rates for Sierra's mass property accounts, I obtained the Company's historical plant data to develop observed life tables for each account. I used Iowa curves to smooth and complete the observed data to calculate the average remaining life of each account. Finally, I analyzed the Company's proposed net salvage rates for each mass account by reviewing the historical salvage data. After estimating the remaining life and salvage rates for each account, I calculated the corresponding depreciation rates. Further details about the actuarial analysis and curve-fitting techniques involved in this process are presented in Appendices B and C, pages 64-91.

Service Life Estimates

Q30. Generally describe your approach in estimating the service lives of mass property.

A30. I used all of the Company's property data and created an observed life table ("OLT") for each account. The data points on the OLT can be plotted to form a curve (the "OLT curve"). The OLT curve is not a theoretical curve, rather, it is actual observed data from the Company's records that indicate the rate of retirement for each property group. An OLT curve by itself, however, is rarely a smooth curve, and is often not a "complete" curve (i.e., it does not end at zero percent surviving). In order to calculate average life (the area under a curve), a complete survivor curve is needed. The Iowa curves are empirically-derived curves based on the extensive studies of the actual mortality patterns of many different types of industrial property. The curve-fitting process involves selecting the best Iowa curve to fit the OLT curve. This can be accomplished through a combination of visual and mathematical curve-fitting techniques, as well as professional judgement. The first step of my approach to curve-fitting involves visually inspecting the OLT curve for any irregularities. For example, if the "tail" end of the curve is erratic and shows a sharp decline over a short period of time, it may indicate that this portion of the data is less reliable, as further discussed below. After inspecting the OLT curve, I use a mathematical curve-fitting technique which essentially involves measuring the distance between the OLT curve and the selected Iowa curve in order to get an objective, mathematical assessment of how well the curve fits. After selecting an Iowa curve, I observe the OLT curve along with the Iowa curve on the same graph to determine how well the curve fits. I may repeat this process several times for any given account to ensure that the most reasonable Iowa curve is selected.

Q31. Do you always select the mathematically best-fitting curve?

A31. Not necessarily. Mathematical fitting is a very important part of the curve-fitting process because it promotes objective, unbiased results. While mathematical curve fitting is important, it may not always yield the optimum result; therefore, it should not necessarily be adopted without further analysis. In fact, for many of the accounts in this case I selected curves that were not the mathematical best fit, and in almost every instance this decision resulted in a shorter curve being chosen. All else held constant, shorter curves result in higher depreciation rates.

Q32. Should every portion of the OLT curve be given equal weight?

A32. Not necessarily. Many analysts have observed that the points comprising the "tail end" of the OLT curve may often have less analytical value than other portions of the curve. "Points at the end of the curve are often based on fewer exposures and may be given less weight than points based on larger samples. The weight placed on those points will depend on the size of the exposures."[32] In accordance with this standard, an analyst may decide to truncate the tail end of the OLT curve at a certain percent of initial exposures, such as one percent. Using this approach puts a greater emphasis on the most valuable portions of the curve. For my analysis in this case, I not only considered the entirety of the OLT curve, but also conducted analyses that involved fitting Iowa curves to the most significant part of the OLT curve. In other words, to verify the accuracy of my curve selection, I narrowed the focus of my additional calculation to consider the top 99% of the "exposures" (i.e., dollars exposed to retirement) and to eliminate the tail end of the curve representing the bottom 1% of exposures.

Analysis of Material Accounts

Q33. Discuss your analysis of material accounts.

A33. My analysis in this case included a review of all the Company's depreciable accounts. I approached my analysis of all mass property accounts the same way using the methods described in this testimony. For several accounts, however, I conducted additional analysis. The "material" accounts discussed in this section are those involving a significant amount of original cost, such that even a small difference in average life estimates can result in a sizeable dollar impact. For these material accounts, I conducted additional analyses that included both visual and mathematical curve fitting techniques not only for the entirety of the OLT curve, but also for the most significant portion of the curve which includes the top 99% of the dollars exposed to retirement. By conducting additional

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[32] Wolf *supra* n. 6, at 46.

analysis on the most significant portions of the OLT, I ensured that the Iowa curves I selected are the best fit to the Company's data.

Q34. Discuss the differences between your service life estimates and the Company's service life estimates for these material accounts

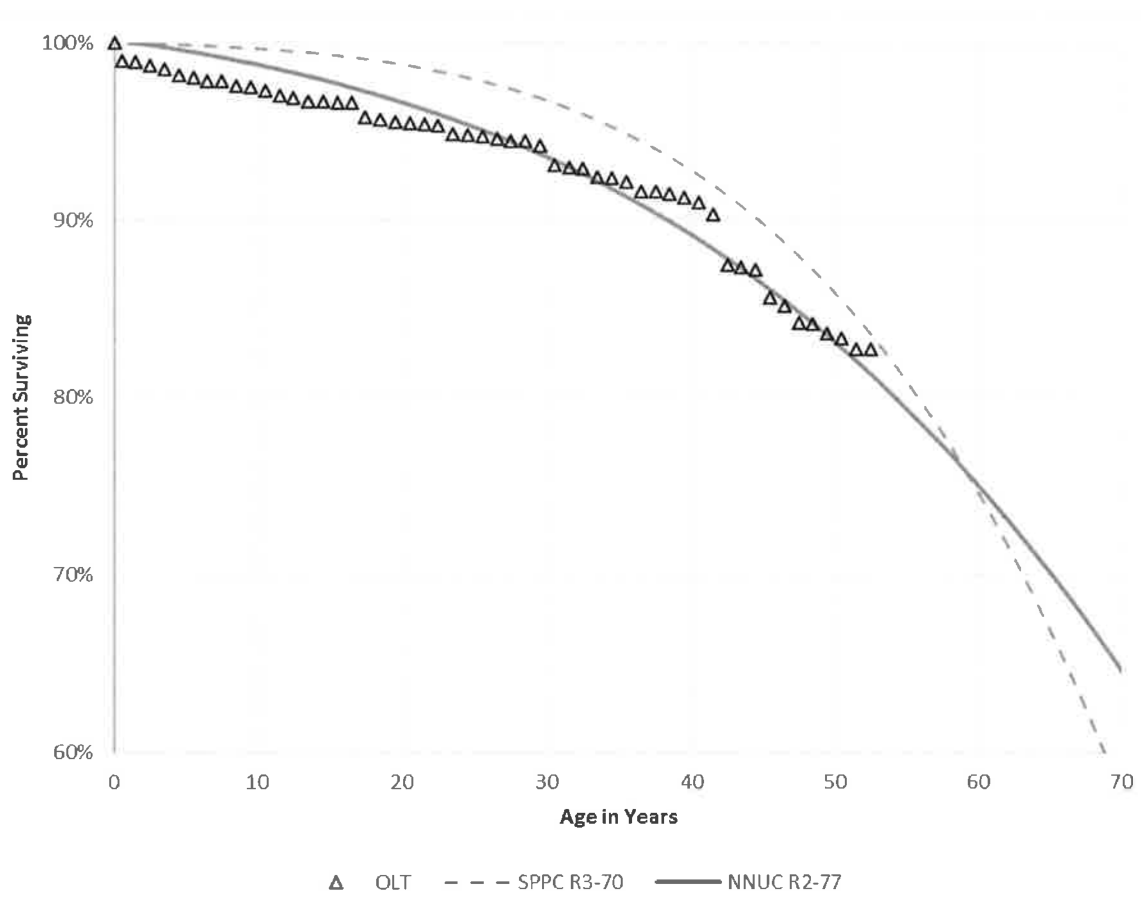
A34. While the Company and I used similar curve-fitting approaches in this case, the curves I selected for these accounts provide a better mathematical fit to the observed data, and provide a more reasonable and accurate representation of the mortality characteristics for each account. In each of the following accounts, the Company has selected a curve that underestimates the average remaining life of the assets in the account, which results in unreasonably high depreciation rates. The analysis of each material account is discussed individually below.

<u>Account 355 – Transmission Poles and Fixtures</u>

Q35. Describe your service life estimate for Account 355, and compare it with the Company's estimate.

A35. The observed survivor curve Account 355 is ideal for standard curve-fitting techniques using Iowa Curves. The observed survivor curve is derived from the OLT calculated from the Company's aged plant data. Thus, as set forth in QA 30 above, the OLT curve is not an estimate or a theoretical curve, rather, it represents actual data. Using both mathematical and visual curve-fitting techniques, I selected the Iowa R2-77 curve type to best represent the future mortality characteristics for this account. In contrast to the R3-70 curve chosen by the Company, the R2-77 curve I selected provides a much better mathematical fit to the observed data. In fact, the R2-77 provides such a better fit that it can easily be confirmed visually, as shown in the graph below. In this graph (as well as the graphs that follow), the black triangles represent the OLT curve. The graphs also show the Iowa curve I selected as well as the Company's selected curve.

Figure 3:
Account 355 – Poles and Fixtures



Q36. Does your selected curve provide a better mathematical fit to the observed data than the Company's curve?

A36. Yes. While it is visually clear that the R2-77 curve is a better fit, this fact can also be confirmed mathematically. Mathematical curve fitting essentially involves measuring the distance between the OLT curve and the selected Iowa curve. The best mathematically-fitted curve is the one that minimizes the distance between the OLT curve and the Iowa curve, thus providing the closest fit. The "distance" between the curves is calculated using the "sum-of-squared differences" ("SSD") technique. In Account 355, the total SSD, or "distance" between the Company's curve and the OLT curve is 0.8661, while the total SSD between R2-77 and the OLT curve is only 0.0418.[33] Thus, the R2-77 is a better mathematical fit.

Q37. Did you also consider the best mathematical fit to the OLT curve for this account using a more significant portion of the curve?

A37. Yes. As discussed above, points at the end of the OLT curve have arguably less statistical value. Using the same sum-of-squared difference calculation up to one percent of the beginning exposures also reveals that the R2-77 curve is still a better fit to the OLT curve than the Company's selected curve. Specifically, the SSD for the significant portion of the curve was 0.0278 for the Company's curve and only 0.0084 for the R2-77. Thus, the R2-77 curve is a better mathematical fit under both scenarios.

Account 356 – Transmission Overhead Conductors and Devices

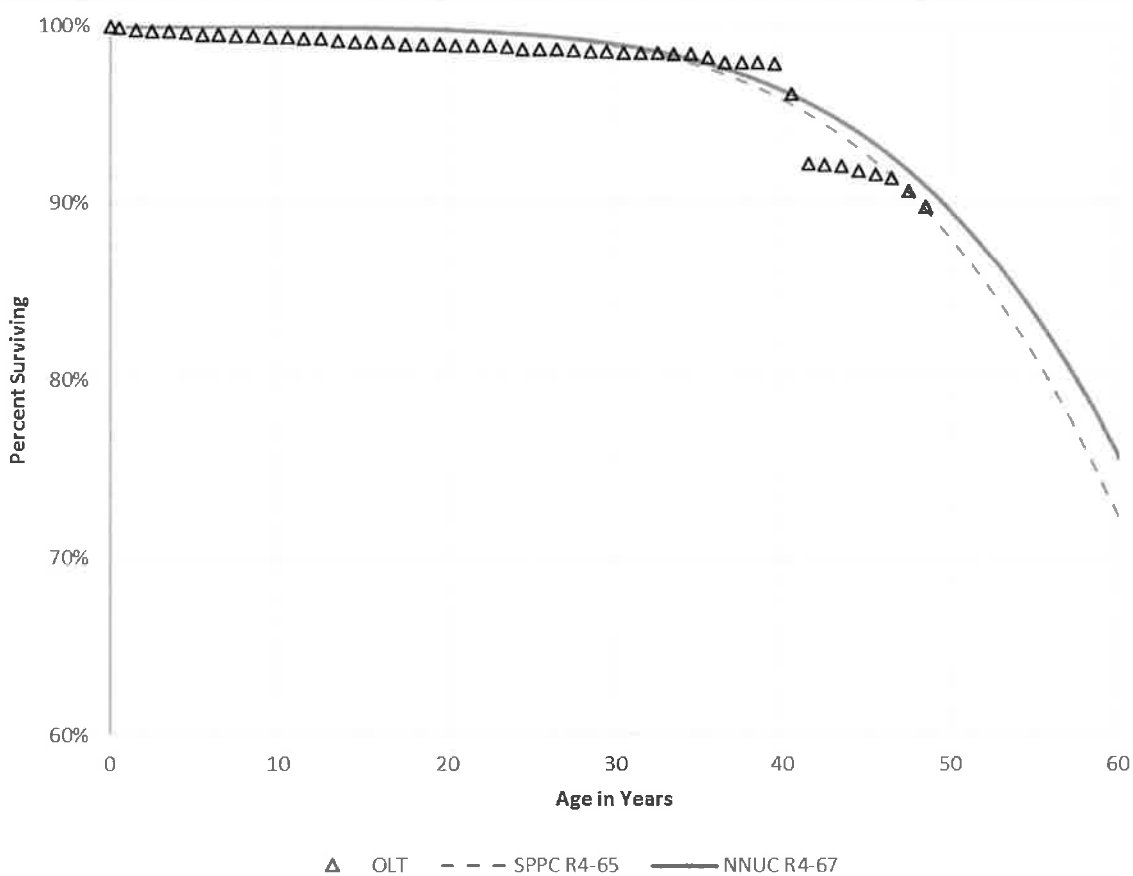
Q38. Describe your service life estimate for Account 356, and compare it with the Company's estimate.

A38. The curve-fitting process for this account highlights the importance of mathematical curve-fitting techniques. This is because it is not practical to visually compare the selected Iowa curves for this account. The curve I selected is the R4-67 curve, and the curve the Company selected is the R4-64 curve. As shown in the graph below, the selected curves are both so close to the OLT curve that it is not easy to determine the better fitting curve through mere

[33] Exhibit DJG 6.

visual inspection. Fortunately, we can use the mathematical sum-of-squared differences approach to reveal the better-fitting curve.

Figure 4:
Account 356 – Overhead Conductors and Devices



Q39. Does your selected curve provide a better mathematical fit to the observed data than the Company's curve?

A39. Yes. The sum-of-squared differences approach mathematically proves that the R4-67 curve is a better fit. This is true not only when fitting to the entire OLT curve, but also when fitting to the top 99% of exposed dollars on the OLT curve. Specifically, the SSD for the Company's curve when fitted to the entire OLT curve was 4.4723, while the SSD for the R4-67 curve was only 3.8342. When fit to the most significant portion of the curve, the SSD for the Company's curve was 0.0043, while the SSD for the R4-67 curve was only 0.0037.[34] Thus, the R4-67 curve is the better fit.

<u>Account 361 – Distribution Structures and Improvements</u>

Q40. Describe your service life estimate for Account 361, and compare it with the Company's estimate.

A40. Unlike the other accounts discussed in this section, Account 361 is not a "material" account in terms of dollars. The original cost in this account is only $3.7 million. This account, however, highlights the Company's tendency to select unreasonably short average service lives for some accounts. As shown in the graph below, the Company's R3-55 curve provides a very poor fit to the OLT curve.

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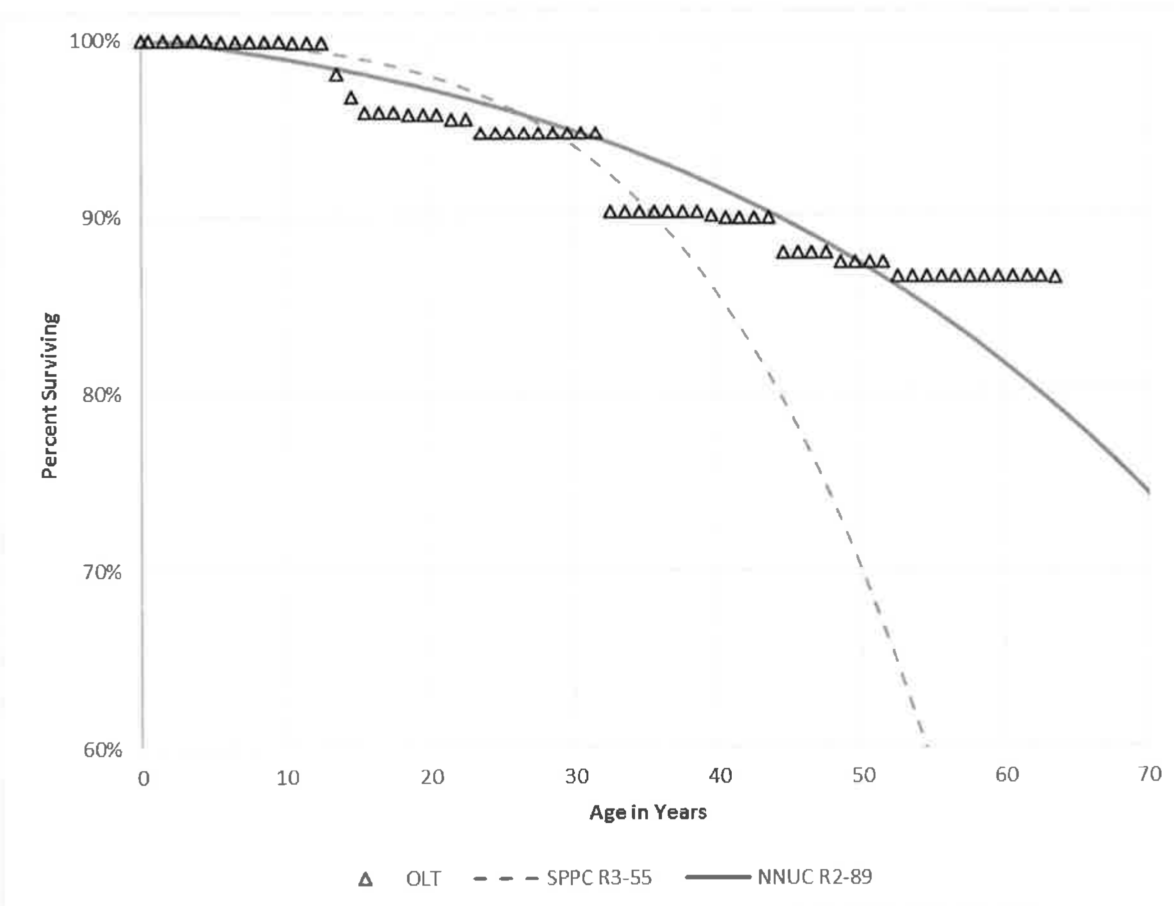
[34] Exhibit DJG 7.

Figure 5:
Account 361 – Structures and Improvements



Q41. Does your selected curve provide a better mathematical fit to the observed data than the Company's curve?

A41. Yes. While it is visually clear that the R2-89 curve provides a much better fit to the observed data, I have also confirmed this mathematically. Specifically, the SSD for the Company's curve when fitted to the entire OLT curve was an extremely high 8.7518, while the SSD for the R2-89 curve was only 0.2754. When fit to the most significant portion of the curve, the SSD for the Company's curve was 2.3275, while the SSD for the R2-89 curve was only 0.0414.[35] Thus, the R2-89 curve is the better fit.

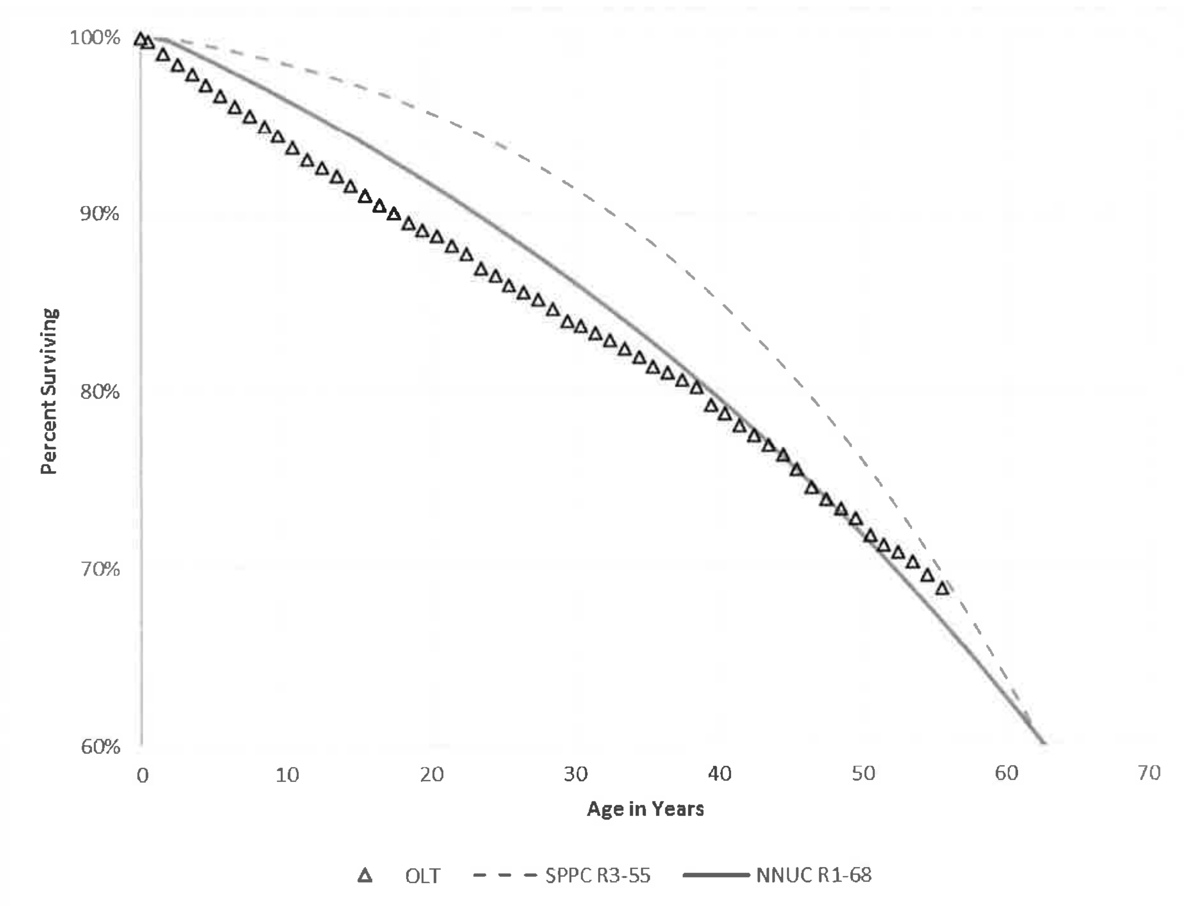
Account 364 – Distribution Poles, Towers, and Fixtures

Q42. Describe your service life estimate for Account 364, and compare it with the Company's estimate.

A42. I selected the R1-68 curve to best describe the mortality characteristics for the assets in Account 364, while the Company selected the R3-55 curve. As with several other accounts discussed in this section, even a quick visual inspection confirms that the curve I selected provides a better fit to the observed data. As shown in the graph below, the Company's R3-55 provides not only an inadequate average service life estimate, but also a poor curve shape. The R1-68 curve is clearly a better fit.

[35] Exhibit DJG 8.

Figure 6:
Account 364 – Poles, Towers, and Fixtures



Q43. Does your selected curve provide a better mathematical fit to the observed data than the Company's curve?

A43. Yes. While it is visually clear that the R1-68 curve provides a much better fit to the observed data, I also confirmed this through the same mathematical curve-fitting process used for the other accounts. Not only is the R1-68 curve a better mathematical fit to the entire OLT curve, but it is also a better fit to the OLT curve up to one percent of the beginning exposures. In other words, when the less significant "tail" of the curve is removed, the R1-68 curve still provides a better mathematical and visual fit. Specifically, the SSD for the Company's curve when fitted to the entire OLT curve was 0.5441 while the SSD for the R1-68 curve was only 0.2043. When fit to the most significant portion of the curve, the SSD for the Company's curve was 0.1304, while the SSD for the R1-68 curve was only 0.0147.[36] Thus, the R1-68 curve is the better fit.

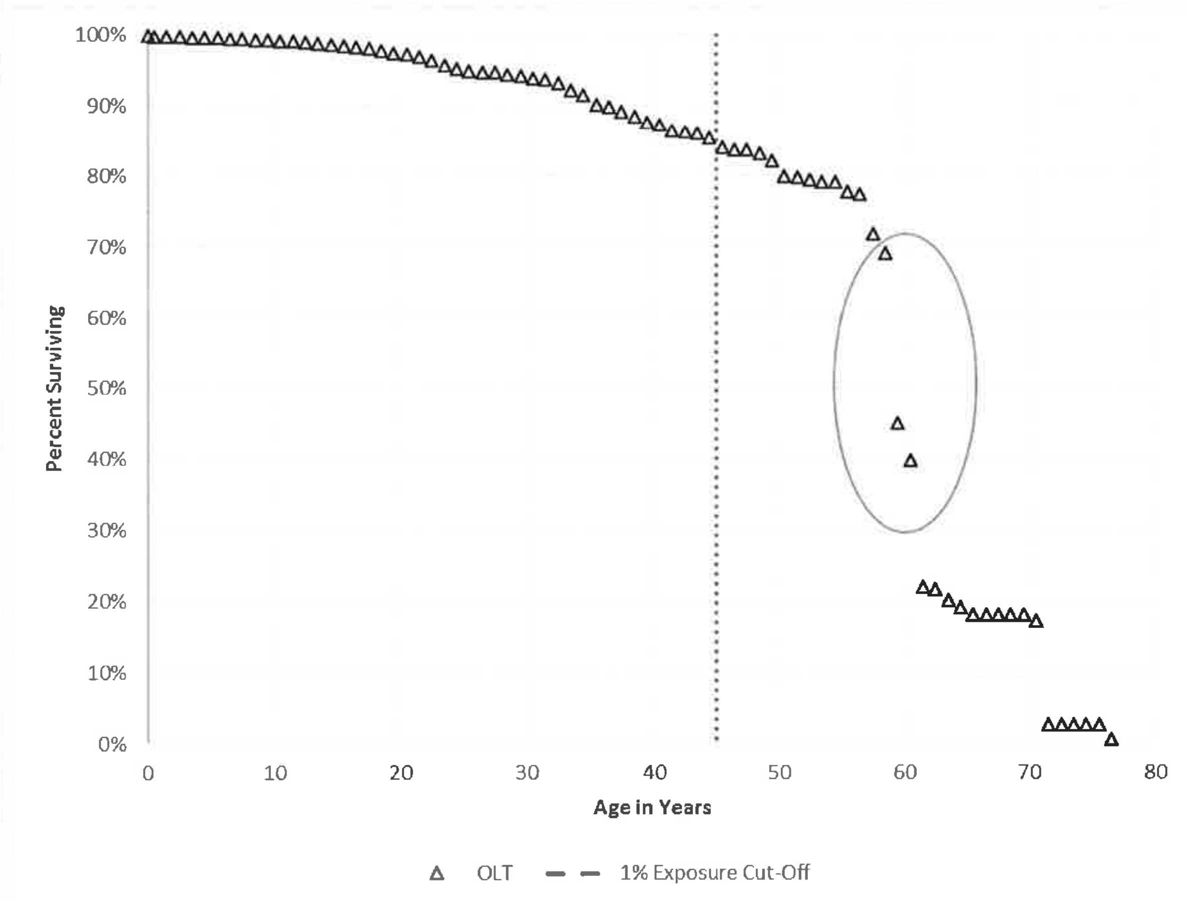
Account 367 – Distribution Underground Conductors and Devices

Q44. Describe your service life estimate for Account 367, and compare it with the Company's estimate.

A44. For Account 367, I selected the S1-75 curve and the Company selected the R3-60 curve. Of all the accounts presented in this section, Account 367 warrants the most analysis and discussion. First, it is impractical to visually determine the better fitting curve for this account. Moreover, the OLT curve for this accounts highlights the importance of giving less statistical weight to the tail end of the OLT curve. The first graph below shows the full OLT curve for this account.

[36] Exhibit DJG 9.

Figure 7:
Account 367 – OLT Curve Only



This graph shows the entire OLT curve obtained from the Company's plant data. All of the data points to the right of the vertical line are those points associated with the bottom 1% of the dollars exposed to retirement. As discussed above, this "tail" end of the curve is arguably less significant from a statistical standpoint. In fact, with this account particularly, trying to fit to the tail end of the curve is especially problematic and leads to unreasonable results. As shown in the graph, the beginning and middle portions of the OLT curve are ideal for Iowa curve-fitting techniques because the curve is relatively smooth and consistent. In other words, it would be easy to draw a smooth curve through these data points. At the age interval of 58 years, however, there is a significant drop in the curve. Examination of the observed life table provides further explanation of this sudden change in the OLT curve. The figure below shows the pertinent portion of the observed life table for this account.

Figure 8:
Account 367 – Portion of Observed Life Table

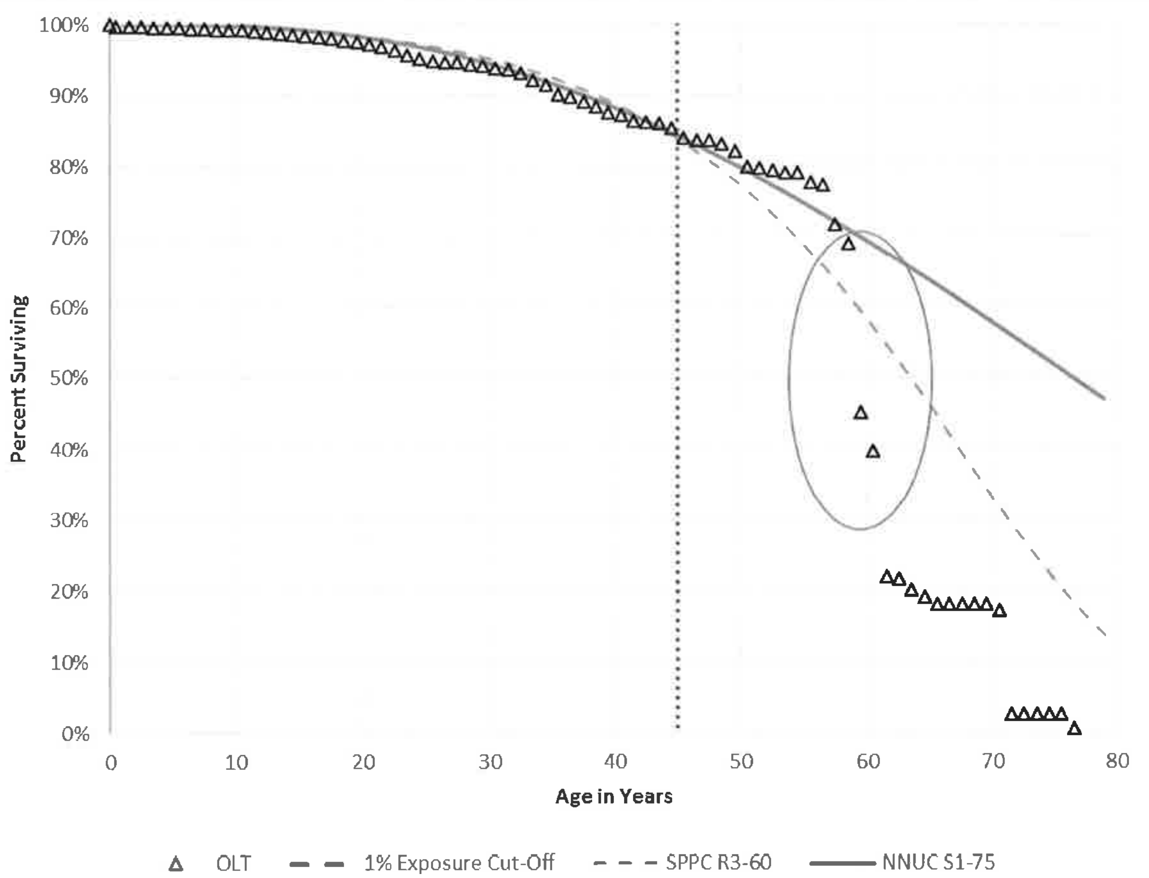
Age	Exposures	Retirements	Retirement Ratio	Survivor Ratio	Percent Surviving
43.5	3,725,015	28,402	0.008	0.992	85.97%
44.5	3,155,771	48,627	0.015	0.985	85.31%
45.5	2,441,813	9,021	0.004	0.996	84.00%
46.5	1,989,141	2,325	0.001	0.999	83.69%
47.5	1,612,932	9,548	0.006	0.994	83.59%
48.5	1,387,602	15,988	0.012	0.989	83.10%
49.5	1,183,473	32,168	0.027	0.973	82.14%
50.5	909,854	2,624	0.003	0.997	79.91%
51.5	813,033	2,236	0.003	0.997	79.67%
52.5	751,727	3,125	0.004	0.996	79.45%
53.5	744,989	903	0.001	0.999	79.12%
54.5	229,660	3,909	0.017	0.983	79.02%
55.5	211,630	1,013	0.005	0.995	77.68%
56.5	208,178	15,185	0.073	0.927	77.31%
57.5	159,287	5,943	0.037	0.963	71.67%
58.5	37,418	12,985	0.347	0.653	**69.00%**
59.5	20,851	2,470	0.119	0.882	**45.06%**
60.5	18,380	8,230	0.448	0.552	39.72%
61.5	10,150	177	0.017	0.983	21.93%

This life table shows the dollars exposed to retirement (or "exposures") at the beginning of each age interval and the dollars retired during each age interval. The retirement ratio is calculated by dividing the retirements by the exposures, and the survivor ratio is simply one minus the retirement ratio. The percent surviving in the far right column is calculated by multiplying the previous survivor ratio by the previous percent surviving. For example, in age interval 44.5, the percent surviving is 85.31%. This was calculated by multiplying the previous survivor ratio of .992 by the previous percent surviving of 85.97%. Notice that in the age interval of 44.5, even a large amount of retirements ($48,627) created a small retirement ratio of only 0.015, and a large survivor ratio of 0.985. As a result, the percent surviving for the next age interval (46.5) decreased by only 0.31% (85.3% - 84.0%). Contrast this with the problematic age interval of 58.5 (highlighted above in Figure 7). It is this age interval where the sharp drop in the OLT curve occurs. In age interval 58.5 there are only $12,985 of retirements, but it results in a very large retirement ratio of 0.347. This is because the beginning exposures of $37,418 are relatively small. As a result, there is a 23.94% decrease in the percent surviving to the next age interval (69.0% - 45.0%). Thus, even though there were four times the amount of retirements in age interval 44.5, age interval 58.5 cause a decrease in the OLT that was over 77 times greater than age interval 44.5. This data set is a good illustration of why the tail end of the OLT curve should often be deemphasized or entirely excluded from the curve-fitting process. Because it has far fewer exposures than other portions of the OLT curve, the tail end of the curve can be erratic and very problematic from a statistical standpoint.

Q45. Did the Company select an Iowa curve that fit the tail end of the curve for this account?

A45. Yes. In fact, the Company's selected Iowa curve cuts straight through the most problematic age interval in the entire OLT curve – the 58.5 age interval discussed above. Essentially, this means that the Company gave the same statistical weight to a mere $37,418 of exposures as it did to the millions of dollars of exposures in the beginning and middle portions of the OLT curve. In contrast, the S1-75 curve I selected focusses on the more meaningful, top 99% of the data and bypasses the erratic and statistically insignificant tail end of this OLT curve. The figure below shows the same OLT curve above along with the selected Iowa curves.

Figure 9:
Account 367 – Entire OLT Curve with Selected Iowa Curves



The original life table for Account 367 in this case actually highlights the importance of visual curve fitting. By visually inspecting the OLT curve, an analyst can see that something unusual is occurring at the age interval of 58 years. Further inspection of the actual observed life table shows that a mere $37,418 of retirements (in an account with $372 million of beginning exposures) caused a massive 24% decrease in the OLT curve. In stark contrast, $375,495 of retirements in age interval 4.5 at the top end of the OLT curve caused a minute 0.11% decrease in the OLT curve.[37] As a result, it is inappropriate to give this portion of the curve any statistical significance in this account. The better approach here is to remove some portion of the tail end of this OLT curve and proceed with the curve-fitting process at that point. Consistent with my approach to the other material accounts discussed in this section, I fitted this OLT curve up to one percent of the beginning exposures, which removes the problematic tail-end of the curve. The graph below compares the selected Iowa curve with the significant portion of the OLT curve.

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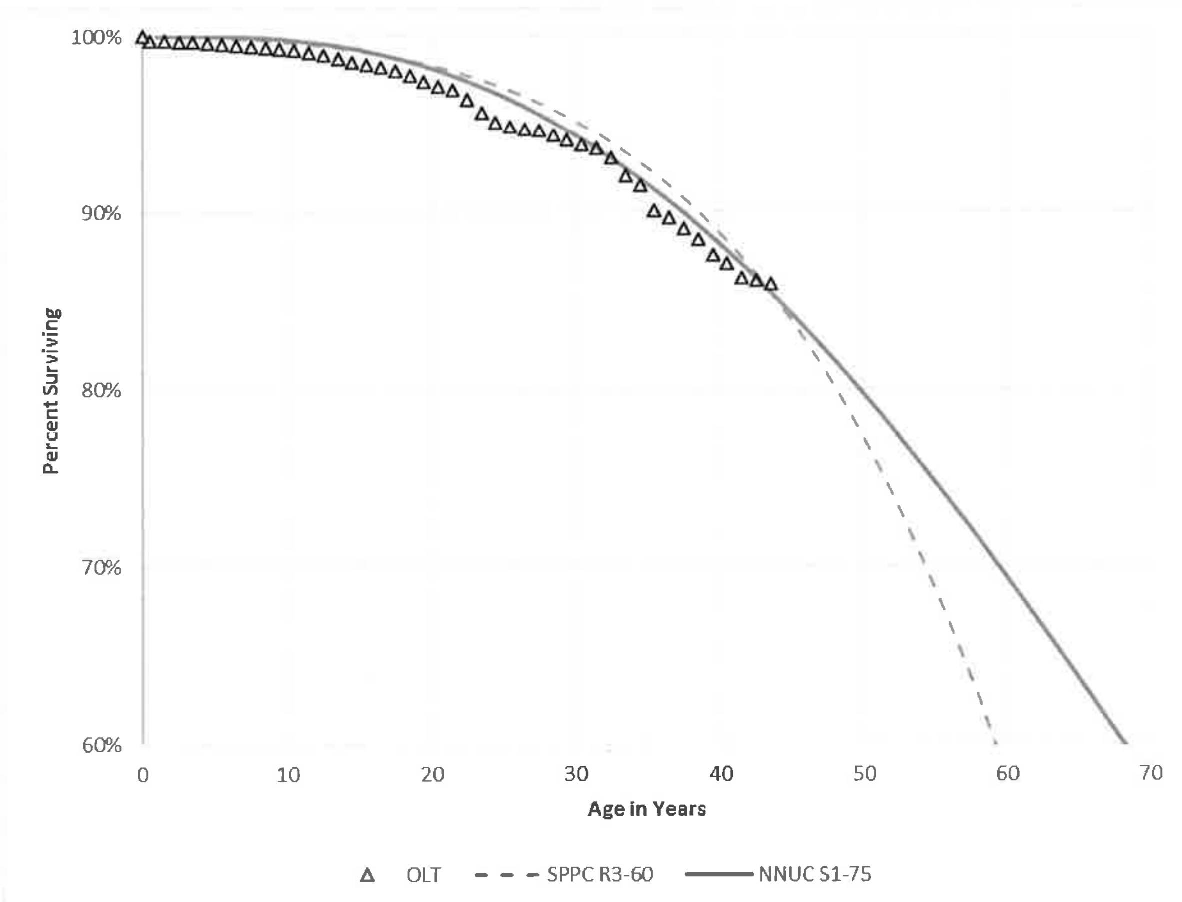
[37] Exhibit DJG 10.

Figure 10:
Account 367 – Underground Conductors and Devices



Q46. Does your selected curve provide a better mathematical fit to the observed data than the Company's curve?

A46. Yes. Removing the erratic tail-end of this OLT curve provides a smooth curve that is ideal for curve-fitting. The Iowa S1-75 curve I selected provides the superior mathematical fit to the significant portion of the OLT curve, and for all of the reasons discussed above, it is the more reasonable of the two curves.[38]

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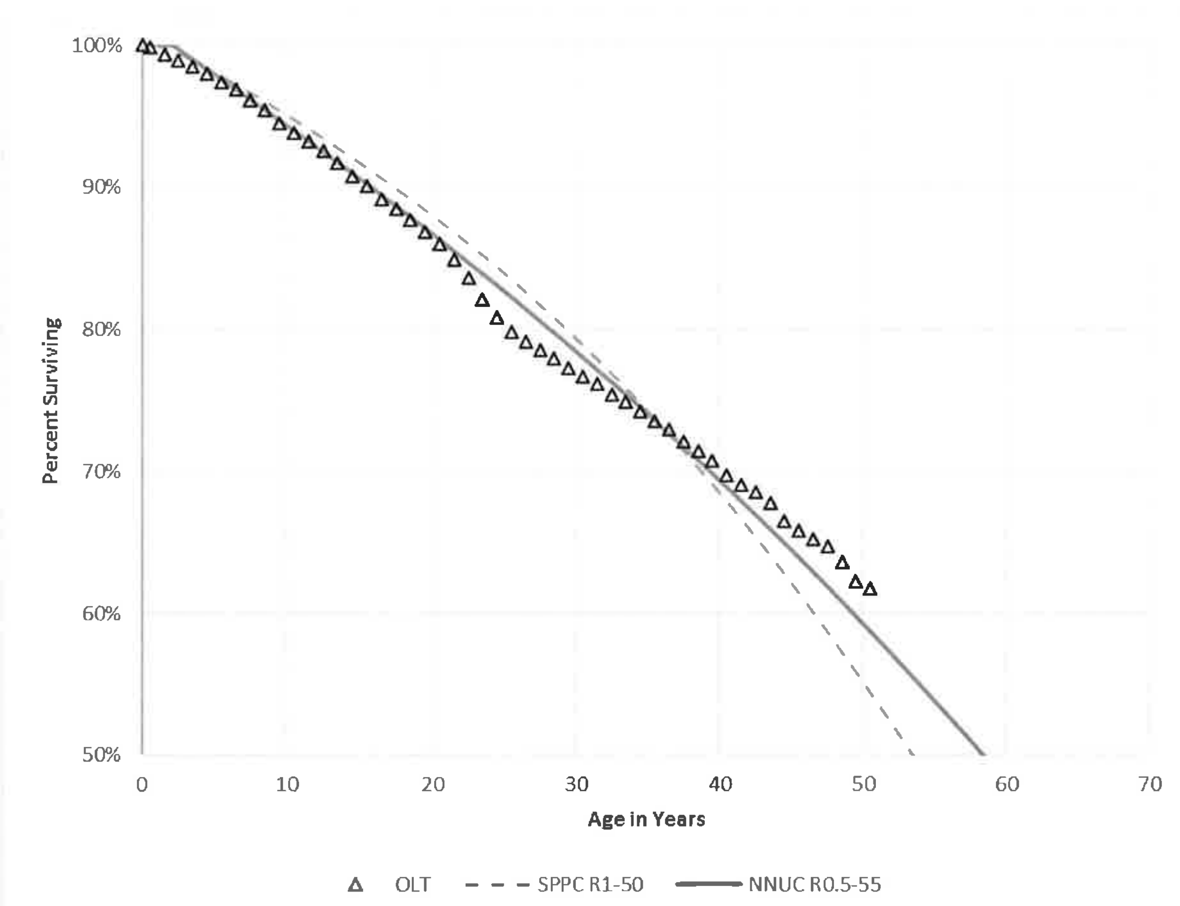
[38] Exhibit DJG 10.

Account 368 – Distribution Transformers

Q47. Describe your service life estimate for Account 368, and compare it with the Company's estimate.

A47. I selected the R0.5-55 curve to describe the mortality characteristics for the assets in Account 368; the Company selected the R1-50 curve. As with several other accounts discussed in this section, even a quick visual inspection confirms that the curve I selected provides a better fit to the observed data, as there is clearly less "distance" between the R0.5-55 curve and the OLT curve. The figure below shows the OLT curve and the two selected Iowa curves.

Figure 11:
Account 368 – Transformers



Q48. Does your selected curve provide a better mathematical fit to the observed data than the Company's curve?

A48. Yes. While it is clear that the R0.5-55 provides a better fit to the observed data, I also confirmed this through the same mathematical curve-fitting process used for the other accounts. Not only is the R0.5-55 curve a better mathematical fit to the entire OLT curve, but it is also a better fit to the OLT curve up to one percent of the beginning exposures. In other words, when the less significant "tail" of the curve is removed, the R0.5-55 curve still provides a better mathematical and visual fit. Specifically, the SSD for the Company's curve when fitted to the entire OLT curve was 0.6285 while the SSD for the R0.5-55 curve was only 0.1550. When fit to the most significant portion of the curve, the SSD for the Company's curve was 0.0584, while the SSD for the R0.5-55 curve was only 0.0189.[39] Thus, the R0.5-55 curve is the better fit.

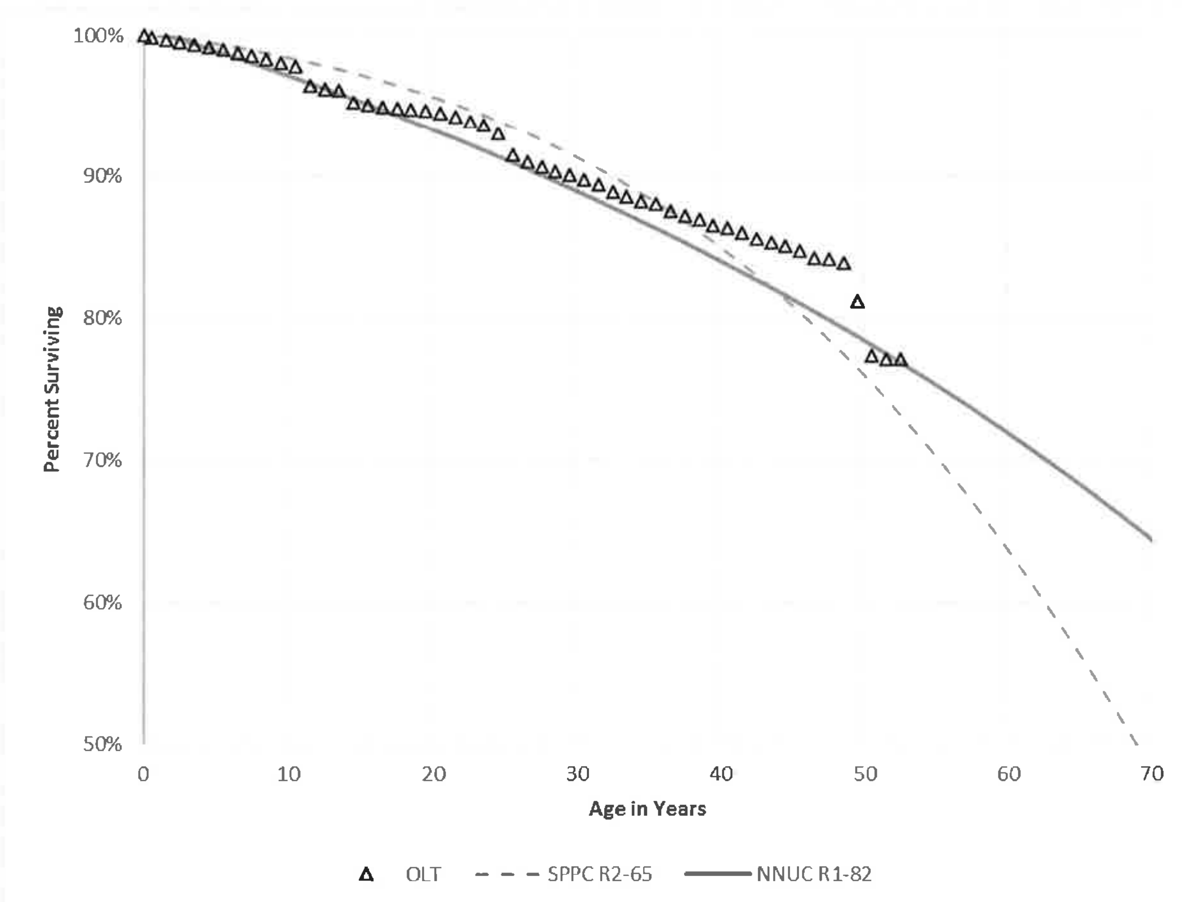
__**Account 369 – Distribution Services**__

Q49. Describe your service life estimate for Account 369, and compare it with the Company's estimate.

A49. I selected the R1-82 curve to best describe the mortality characteristics of this account, while the Company selected the R2-65 curve which resulted in a shorter depreciable life. As with many other accounts discussed in this section, it is clear that the curve I selected provides a better fit to the OLT curve. This is illustrated in the figure below.

[39] Exhibit DJG 11.

Figure 12:
Account 369 – Services



Q50. Does your selected curve provide a better mathematical fit to the observed data than the Company's curve?

A50. Yes. While it is clear that the R1-82 curve provides a better fit to the observed data, I also confirmed this through the same mathematical curve-fitting process used for the other accounts. Not only is the R1-82 curve a better mathematical fit to the entire OLT curve, but it is also a better fit to the OLT curve up to one percent of the beginning exposures. Specifically, the SSD for the Company's curve when fitted to the entire OLT curve was 1.5729 while the SSD for the R1-82 curve was only 0.2404. When fit to the most significant portion of the curve, the SSD for the Company's curve was 0.0402, while the SSD for the R1-82 curve was only 0.0295.[40] Thus, the R1-82 curve is the better fit.

Account 303 – Software

Q51. Describe the Company's position regarding Account 303 – Software.

A51. The original cost investments in software are divided between intangible plant and common plant. The intangible plant contains $27 million of original cost. The Company is proposing an SQ-10 curve to represent the service life of these assets, which results in a depreciation rate of 3.43%.[41] The common plant portion of software contains $147 million of investment. Applying the Company's SQ-10 curve to this portion of the account results in a depreciation rate of 5.74%.[42] The Company's total original cost investment in software is more than $175 million and its total proposed depreciation expense for software is $9.4 million.

Q52. Do you agree with the Company's position?

A52. No. By choosing an SQ-10 curve for software, the Company estimates that the average service life of its software programs are only 10 years on average. While a 10-year average life may be appropriate estimate for basic consumer software systems, it is likely insufficient to accurately describe the service life of major software systems. Unlike basic consumer software systems, large enterprise software systems can be customized to the specific needs of the company. These modular systems require substantial upfront

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[40] Exhibit DJG 12.

[41] Direct Testimony of Ned W. Allis, Statement A.

[42] *Id.*

engineering costs along with periodic maintenance and support fees to ensure that the system performs reliably over a long period of time. For example, many utility companies rely on Enterprise Resource Planning ("ERP") systems comprising a suite of modular applications that collect and integrate data from different facets of the firm.

Q53. Are you aware of service life estimates of Enterprise Resource Planning systems of 20 years or more?

A53. Yes. ERP systems are designed to provide long term solutions to companies. SAP is one of several providers of ERP systems. According to a report by CGI Consulting Services, SAP systems can last 25 – 30 years.[43] Given the extremely high installation costs for these complex systems as well as the annual maintenance fees, it is not surprising that companies using ERP systems would demand that the systems last longer than 10 years.

Q54. Have utility companies recognized that their ERP systems can last at least 20 years?

A54. Yes. Florida Power & Light ("FP&L") is one of many utilities that utilize ERP systems. In 2011, FP&L implemented SAP's ERP system to replace its previous accounting system.[44] FP&L had previously amortized its software over a five-year period. FP&L, however, requested that the amortization period be extended to 20 years in order to reflect the much longer lifespan of the new ERP system.[45] Kim Ousdahl, FP&L's Vice President, Controller and Chief Accounting Officer, gave the following testimony regarding FP&L's software account:

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[43] *Taking the Long View to SAP Value*, CGI, "Enlightened Managed Services Series," CGI Group Inc. 2011 p. 2.

[44] Petition for Rate Increase by Florida Power & Light Company, Docket No. 120015-EI, Testimony & Exhibits of Kim Ousdahl. p. 14.

[45] *Id.*

> In 2011, the Company implemented a new general ledger accounting system (SAP) to replace its legacy system . . . . FPL's policy for accounting for new software requires . . . amortization on a straight-line basis over a period of five years, which is the current amortization period approved for this account. The Company is requesting to extend the amortization period of this system from five to twenty years in order to more appropriately recognize the longer benefit period expected from this major business system.[46]

While a 10-year average life may have been appropriate for older, more basic software systems, it does not reflect the much longer service life of newer, more complex systems.

Q55. Does Sierra still utilize software that is more than 25 years old?

A55. Yes. According to the Company, it still uses software than was installed in 1988.[47]

Q56. Are you recommending that the Company extend the service life of its software account to 20 years?

A56. No. Although it would be reasonable to consider a 20-year lifespan for the Company's software account, I am recommending a 15-year lifespan for this account. I have calculated the remaining lives and depreciation rates for software in both the intangible and common plant functions under an SQ-15 curve.[48]

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[46] *Id.*

[47] See response to NNUC-17 (attachment).

[48] *See* Exhibit DJG 13 for intangible plant software calculations; *see* Exhibit DJG 14 for common plant software calculations.

Mass Salvage Analysis

Q57. Describe your approach to estimating net salvage rates for mass property accounts.

A57. To estimate net salvage for the mass property accounts, I analyzed the Company's historical cost of removal and gross salvage data. I analyzed this data on an annual basis as well as three-year and five-year rolling averages.

Q58. What is your general recommendation with regard to the Company's proposed net salvage rates for mass accounts?

A58. For most of the mass property accounts, I am recommending that the Commission adopt the net salvage rates that it approved in the previous depreciation case. On the remaining accounts, I am not proposing an adjustment to the Company's position. I provide a more detailed discussion on several material accounts below.

Account 355 – Transmission Poles and Fixtures

Q59. Discuss the Company's position regarding this account.

A59. The Company is proposing to increase the negative net salvage rate on this account by 20% (from -40% to -60%).

Q60. Do you agree with the Company's position?

A60. No. Although the annual negative net salvage percentages have been high over the past few years, it is important to look further into the data to see what is driving the net salvage rates. For example, the three-year period of 2013 – 2015 had a negative net salvage rate of 134%.[49] This three-year average, however, is affected by two unusually large negative

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[49] 2016 Depreciation Study for Sierra's electric plant, Part VIII Errata #1, p. VIII-30.

net salvage percentages in 2013 and 2015. In 2013, there was a relatively small amount of retirements of $48,921, but an extremely large negative net salvage rate of 287%.[50] To put that in perspective, in the years just before and after 2013, there were nearly four times the amount of retirements, but no negative net salvage. The level of retirements and cost of removal are more consistent in the three-year rolling averages over the 12-year period from 2000 – 2012. During those years, the negative net salvage was greater than 40% only once. Furthermore, the annual average negative net salvage during that 12-year period was only 22%, which is only about half of the negative net salvage I am proposing for this account (-40%). This is same net salvage rate approved by the Commission in the prior depreciation case.

Q61. What is your recommended net salvage rate for Account 355?

A61. I recommend the currently-approved net salvage rate of -40% for this account.

<u>Account 356 – Transmission Overhead Conductors and Devices</u>

Q62. Discuss the Company's position regarding this account.

A62. The Company is proposing a substantial 67% increase in the negative net salvage rate for this account (from -30% to -50%).

Q63. Do you agree with the Company's position?

A63. No. In finding that a -30% salvage rate was appropriate for this account in the previous order, the Commission said that "[s]alvage rates should consider the whole life of the assets

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[50] *Id.* at VIII-29.

and not focus on the last three years. . . ."[51] By asking for a 67% increase in the net salvage rate for this account, it appears that the Company is only focusing on the last three years. The three year rolling average from 2013 – 2015 had unusually large negative net salvage rate of 112%.[52] In contrast, the previous four rolling averages had an average negative net salvage rate of only 24%. Thus, a negative net salvage rate of 30% for this account is reasonable.

Q64. What is your recommended net salvage rate for Account 356?

A64. I recommend the currently approved net salvage rate of -30% for this account.

Account 364 – Distribution Poles, Towers, and Fixtures

Q65. Discuss the Company's position regarding this account.

A65. The Company is proposing a 40% increase in the negative net salvage rate for this account (from -50% to -70%).

Q66. Do you agree with the Company's position?

A66. No. As with the accounts previously discussed in this section, the Company has experienced a recent, unusual spike in the net salvage rate in this account. The three previous rolling averages resulted in an average net salvage rate of about 50%, which is equal to the currently approved net salvage rate. In fact, out of the last 15 three-year rolling averages, only four have exceeded -70%.[53]

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[51] Modified Final Order (Docket Nos. 13-06002, 13-06003, 13-06004) dated 1-30-14, p. 49.

[52] 2016 Depreciation Study for Sierra's electric plant, Part VIII Errata #1, p. VIII-32.

[53] *See id.* at VIII-38-39.

Q67. What is your recommended net salvage rate for Account 364?

A67. I recommend the currently approved net salvage rate of -50% for this account.

Account 365 – Distribution Overhead Conductors and Devices

Q68. Discuss the Company's position regarding this account.

A68. The Company is proposing an increase in the negative net salvage rate for this account (from -50% to -60%).

Q69. Do you agree with the Company's position?

A69. No. The Company appears to be basing its recommendation on a recent, unusual spike in the negative net salvage rate for this account. Before the most recent three-year average, the average of the previous 13 average net salvage rates was only -30%.[54]

Q70. What is your recommended net salvage rate for Account 365?

A70. I recommend the currently approved net salvage rate of -50% for this account.

CALCULATED ACCUMULATED DEPRECIATION

Q71. Describe calculated accumulated depreciation.

A71. Calculated accumulated depreciation (or the "theoretical reserve") is the calculated balance that would be in the accumulated depreciation account at a point in time using current depreciation parameters, such as average service life and net salvage. In other words, the theoretical reserve is the amount that would be in the accumulated depreciation account had the current depreciation parameters been in place all along. There is almost always an imbalance between the actual accumulated depreciation amount and the theoretical reserve

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[54] *See id.* at VIII-40-41.

(referred to in these proceedings as the "theoretical reserve imbalance" or "TRI"). If the whole life application technique is used, this imbalance should be amortized in order to bring the actual accumulated depreciation balance closer to the theoretical reserve. If the remaining life application technique is used, however, any imbalance between the actual accumulated depreciation amount and the theoretical reserve is "automatically" amortized over the remaining life of the account. That is, it is usually not necessary to make a separate adjustment to amortize the TRI if the remaining life application technique is employed, unless the TRI is excessive.

Q72. Did the Commission order an amortization of the TRI in the previous depreciation proceeding?

A72. Yes. The Commission ordered amortization of 25% of the TRI for transmission and distribution accounts over a six-year period. The Commission also ordered that approximately $17.2 million be transferred from Account 369 – Services to offset the unrecovered costs of legacy meters.[55] In his direct testimony, Mr. Allis stated that there should be no additional accelerated amortization of the TRI at this time.[56]

Q73. Do you agree with Mr. Allis that additional amortization of the TRI is not necessary at this time?

A73. Yes. Both Mr. Allis and I have employed the remaining life technique in determining our proposed depreciation rates. The remaining life technique has a built-in mechanism to correct the TRI in accordance with current depreciation parameters. Because the TRI was so excessive in the previous depreciation case, the Commission was correct to order a

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[55] *See* Direct Testimony of Ned W. Allis p. 24; *see also* Direct Testimony of Ellen Y. Fincher p. 6.

[56] *See* Direct Testimony of Ned W. Allis p. 27, lines 17-18.

separate, "manual" amortization of the TRI. As stated by the Company, however, the TRI has significantly decreased since the last case.[57] This means that the Commission's prior order regarding the TRI is reducing the imbalance as intended. While the exact level of TRI would be different under the depreciation parameters proposed in my testimony, it would not be excessive enough to warrant additional corrective measures, especially since I have used the remaining life depreciation technique to develop my proposed rates. The Commission should monitor the TRI in each case to ensure that the imbalance is not excessive at any given time.

CONCLUSION AND RECOMMENDATION

Q74. Summarize the key points of your testimony.

A74. I employed a well-established depreciation system and used actuarial analysis to statistically analyze the Company's depreciable assets in order to develop reasonable depreciation rates in this case. For Sierra's production units, I did not propose any adjustments to the Company's proposed interim retirement curves or terminal net salvage values. I proposed extending the life of the new Tracy combined cycle plant to more accurately reflect the plant's probable economic life. I also recommended several adjustments to the Company's transmission and distribution accounts. The adjustments I proposed for these accounts were based on the facts that the Iowa curves I selected provide a more accurate and reasonable representation of the retirement rate and remaining lives for these accounts. Finally, I analyzed the Company's proposals to change the net salvage rates in its transmission and distribution accounts. I recommended adjustments to several

[57] *See id.* at p. 27, lines 21-22.

of these accounts based on the historical retirement data and the Commission's prior order regarding these accounts.

Q75. What is NNUC's recommendation to the Commission with regard to depreciation rates and expense?

A75. NNUC recommends that the Commission adopt the proposed depreciation rates presented in Exhibit DJG 5.

Q76. Does this conclude your testimony?

A76. Yes.

AFFIRMATION

STATE OF OKLAHOMA)
) ss.
COUNTY OF OKLAHOMA)

I, DAVID J. GARRETT, do hereby swear under penalty of perjury the following:

That I am the person identified in the attached Prepared Testimony, and that such testimony was prepared by me or under my direct supervision; that the answers and information set forth therein are true to the best of my knowledge and belief; and that if asked questions set forth herein; my answers thereto would, under oath, remain the same.

DAVID J. GARRETT

Subscribed and sworn to (or affirmed) before me
on this 22 day of September, 2016, by DAVID J. GARRETT,
proved to me on the basis of satisfactory evidence
to be the person who appeared before me.

NOTARY PUBLIC

GARRY GARRETT NOTARY # 12011828 EXP. 12/18/16 PUBLIC STATE OF OKLAHOMA

APPENDIX A:

THE DEPRECIATION SYSTEM

A depreciation accounting system may be thought of as a dynamic system in which estimates of life and salvage are inputs to the system, and the accumulated depreciation account is a measure of the state of the system at any given time.[58] The primary objective of the depreciation system is the timely recovery of capital. The process for calculating the annual accruals is determined by the factors required to define the system. A depreciation system should be defined by four primary factors: 1) a method of allocation; 2) a procedure for applying the method of allocation to a group of property; 3) a technique for applying the depreciation rate; and 4) a model for analyzing the characteristics of vintage groups comprising a continuous property group.[59] The figure below illustrates the basic concept of a depreciation system and includes some of the available parameters.[60]

There are hundreds of potential combinations of methods, procedures, techniques, and models, but in practice, analysts use only a few combinations. Ultimately, the system selected must result in the systematic and rational allocation of capital recovery for the utility. Each of the four primary factors defining the parameters of a depreciation system is discussed further below.

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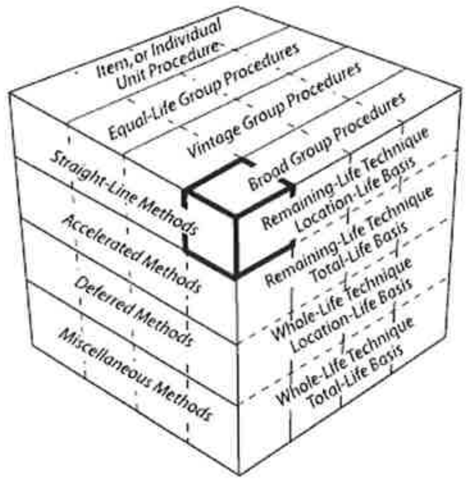
[58] Wolf *supra* n. 6, at 69-70.

[59] *See* Wolf *supra* n. 6, at 70, 139-40.

[60] Edison Electric Institute, *Introduction to Depreciation* (inside cover) (EEI April 2013). Some definitions of the terms shown in this diagram are not consistent among depreciation practitioners and literature due to the fact that depreciation analysis is a relatively small and fragmented field. This diagram simply illustrates the some of the available parameters of a depreciation system.

Figure 13:
The Depreciation System Cube



1. <u>Allocation Methods</u>

The "method" refers to the pattern of depreciation in relation to the accounting periods. The method most commonly used in the regulatory context is the "straight-line method" – a type of age-life method in which the depreciable cost of plant is charged in equal amounts to each accounting period over the service life of plant.[61] Because group depreciation rates and plant balances often change, the amount of the annual accrual rarely remains the same, even when the straight-line method is employed.[62] The basic formula for the straight-line method is as follows:[63]

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[61] NARUC *supra* n. 7, at 56.

[62] *Id.*

[63] *Id.*

Equation 1:
Straight-Line Accrual

$$Annual\ Accrual = \frac{Gross\ Plant - Net\ Salavage}{Service\ Life}$$

Gross plant is a known figure from the utility's records, while both net salvage and service life must be estimated in order to calculate the annual accrual. The straight-line method differs from accelerated methods of recovery, such as the "sum-of-the-years-digits" method and the "declining balance" method. Accelerated methods are primarily used for tax purposes and are rarely used in the regulatory context for determining annual accruals.[64] In practice, the annual accrual is expressed as a rate which is applied to the original cost of plant in order to determine the annual accrual in dollars. The formula for determining the straight-line rate is as follows:[65]

Equation 2:
Straight-Line Rate

$$Depreciation\ Rate\ \% = \frac{100 - Net\ Salvage\ \%}{Service\ Life}$$

2. Grouping Procedures

The "procedure" refers to the way the allocation method is applied through subdividing the total property into groups.[66] While single units may be analyzed for depreciation, a group plan of depreciation is particularly adaptable to utility property. Employing a grouping procedure allows for a composite application of depreciation rates to groups of similar property, rather than

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[64] *Id.* at 57.

[65] *Id.* at 56.

[66] Wolf *supra* n. 6, at 74-75.

excessively conducting calculations for each unit. Whereas an individual unit of property has a single life, a group of property displays a dispersion of lives and the life characteristics of the group must be described statistically.[67] When analyzing mass property categories, it is important that each group contains homogenous units of plant that are used in the same general manner throughout the plant and operated under the same general conditions.[68]

The "average life" and "equal life" grouping procedures are the two most common. In the average life procedure, a constant annual accrual rate based on the average life of all property in the group is applied to the surviving property. While property having shorter lives than the group average will not be fully depreciation, and likewise, property having longer lives than the group average will be over-depreciated, the ultimate result is that the group will be fully depreciated by the time of the final retirement.[69] Thus, the average life procedure treats each unit as though its life is equal to the average life of the group. In contrast, the equal life procedure treats each unit in the group as though its life was known.[70] Under the equal life procedure the property is divided into subgroups that each has a common life.[71]

3. <u>Application Techniques</u>

The third factor of a depreciation system is the "technique" for applying the depreciation rate. There are two commonly used techniques: "whole life" and "remaining life." The whole life technique applies the depreciation rate on the estimated average service life of group, while

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[67] *Id.* at 74.

[68] NARUC *supra* n. 7, at 61-62.

[69] *See* Wolf *supra* n. 6, at 74-75.

[70] *Id.* at 75.

[71] *Id.*

the remaining life technique seeks to recover undepreciated costs over the remaining life of the plant.[72]

In choosing the application technique, consideration should be given to the proper level of the accumulated depreciation account. Depreciation accrual rates are calculated using estimates of service life and salvage. Periodically these estimates must be revised due to changing conditions, which cause the accumulated depreciation account to be higher or lower than necessary. Unless some corrective action is taken, the annual accruals will not equal the original cost of the plant at the time of final retirement.[73] Analysts can calculate the level of imbalance in the accumulated depreciation account by determining the "calculated accumulated depreciation," (a.k.a. "theoretical reserve" and referred to in these appendices as "CAD"). The CAD is the calculated balance that would be in the accumulated depreciation account at a point in time using current depreciation parameters.[74] An imbalance exists when the actual accumulated depreciation account does not equal the CAD. The choice of application technique will affect how the imbalance is dealt with.

Use of the whole life technique requires that an adjustment be made to accumulated depreciation after calculation of the CAD. The adjustment can be made in a lump sum or over a period of time. With use of the remaining life technique, however, adjustments to accumulated depreciation are amortized over the remaining life of the property and are automatically included

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[72] NARUC *supra* n. 7, at 63-64.

[73] Wolf *supra* n. 6, at 83.

[74] NARUC *supra* n. 7, at 325.

in the annual accrual.[75] This is one reason that the remaining life technique is popular among practitioners and regulators. The basic formula for the remaining life technique is as follows:[76]

Equation 3:
Remaining Life Accrual

$$Annual\ Accrual = \frac{Gross\ Plant - Accumulated\ Depreciation - Net\ Salvage}{Average\ Remaining\ Life}$$

The remaining life accrual formula is similar to the basic straight-line accrual formula above with two notable exceptions. First, the numerator has an additional factor in the remaining life formula: the accumulated depreciation. Second, the denominator is "average remaining life" instead of "average life." Essentially, the future accrual of plant (gross plant less accumulated depreciation) is allocated over the remaining life of plant. Thus, the adjustment to accumulated depreciation is "automatic" in the sense that it is built into the remaining life calculation.[77]

4. <u>Analysis Model</u>

The fourth parameter of a depreciation system, the "model," relates to the way of viewing the life and salvage characteristics of the vintage groups that have been combined to form a continuous property group for depreciation purposes.[78] A continuous property group is created when vintage groups are combined to form a common group. Over time, the characteristics of the property may change, but the continuous property group will continue. The two analysis models

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[75] NARUC *supra* n. 7, at 65 ("The desirability of using the remaining life technique is that any necessary adjustments of [accumulated depreciation] . . . are accrued automatically over the remaining life of the property. Once commenced, adjustments to the depreciation reserve, outside of those inherent in the remaining life rate would require regulatory approval.").

[76] *Id.* at 64.

[77] Wolf *supra* n. 6, at 178.

[78] *See* Wolf *supra* n. 6, at 139 (I added the term "model" to distinguish this fourth depreciation system parameter from the other three parameters).

used among practitioners, the "broad group" and the "vintage group," are two ways of viewing the life and salvage characteristics of the vintage groups that have been combined to from a continuous property group.

The broad group model views the continuous property group as a collection of vintage groups that each has the same life and salvage characteristics. Thus, a single survivor curve and a single salvage schedule are chosen to describe all the vintages in the continuous property group. In contrast, the vintage group model views the continuous property group as a collection of vintage groups that may have different life and salvage characteristics. Typically, there is not a significant difference between vintage group and broad group results unless vintages within the applicable property group experienced dramatically different retirement levels than anticipated in the overall estimated life for the group. For this reason, many analysts utilize the broad group procedure because it is more efficient.

APPENDIX B:

IOWA CURVES

Early work in the analysis of the service life of industrial property was based on models that described the life characteristics of human populations.[79] This explains why the word "mortality" is often used in the context of depreciation analysis. In fact, a group of property installed during the same accounting period is analogous to a group of humans born during the same calendar year. Each period the group will incur a certain fraction of deaths / retirements until there are no survivors. Describing this pattern of mortality is part of actuarial analysis, and is regularly used by insurance companies to determine life insurance premiums. The pattern of mortality may be described by several mathematical functions, particularly the survivor curve and frequency curve. Each curve may be derived from the other so that if one curve is known, the other may be obtained. A survivor curve is a graph of the percent of units remaining in service expressed as a function of age.[80] A frequency curve is a graph of the frequency of retirements as a function of age. Several types of survivor and frequency curves are illustrated in the figures below.

1. <u>Development</u>

The survivor curves used by analysts today were developed over several decades from extensive analysis of utility and industrial property. In 1931 Edwin Kurtz and Robley Winfrey used extensive data from a range of 65 industrial property groups to create survivor curves representing the life characteristics of each group of property.[81] They generalized the 65 curves

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[79] Wolf *supra* n. 6, at 276.

[80] *Id.* at 23.

[81] *Id.* at 34.

into 13 survivor curve types and published their results in *Bulletin 103: Life Characteristics of Physical Property*. The 13 type curves were designed to be used as valuable aids in forecasting probable future service lives of industrial property. Over the next few years, Winfrey continued gathering additional data, particularly from public utility property, and expanded the examined property groups from 65 to 176.[82] This resulted in 5 additional survivor curve types for a total of 18 curves. In 1935, Winfrey published *Bulletin 125: Statistical Analysis of Industrial Property Retirements*. According to Winfrey, "[t]he 18 type curves are expected to represent quite well all survivor curves commonly encountered in utility and industrial practices."[83] These curves are known as the "Iowa curves" and are used extensively in depreciation analysis in order to obtain the average service lives of property groups. (Use of Iowa curves in actuarial analysis is further discussed in Appendix C.)

In 1942, Winfrey published *Bulletin 155: Depreciation of Group Properties*. In Bulletin 155, Winfrey made some slight revisions to a few of the 18 curve types, and published the equations, tables of the percent surviving, and probable life of each curve at five-percent intervals.[84] Rather than using the original formulas, analysts typically rely on the published tables containing the percentages surviving. This is because absent knowledge of the integration technique applied to each age interval, it is not possible to recreate the exact original published table values.

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[82] *Id.*

[83] Robley Winfrey, *Bulletin 125: Statistical Analyses of Industrial Property Retirements* 85, Vol. XXXIV, No. 23 (Iowa State College of Agriculture and Mechanic Arts 1935).

[84] Robley Winfrey, Bulletin 155: Depreciation of Group Properties 121-28, Vol XLI, No. 1 (The Iowa State College Bulletin 1942); see also Wolf supra n. 6, at 305-38 (publishing the percent surviving for each Iowa curve, including "O" type curve, at one percent intervals).

In the 1970s, John Russo collected data from over 2,000 property accounts reflecting observations during the period 1965 – 1975 as part of his Ph.D. dissertation at Iowa State. Russo essentially repeated Winfrey's data collection, testing, and analysis methods used to develop the original Iowa curves, except that Russo studied industrial property in service several decades after Winfrey published the original Iowa curves. Russo drew three major conclusions from his research:[85]

1. No evidence was found to conclude that the Iowa curve set, as it stands, is not a valid system of standard curves;

2. No evidence was found to conclude that new curve shapes could be produced at this time that would add to the validity of the Iowa curve set; and

3. No evidence was found to suggest that the number of curves within the Iowa curve set should be reduced.

Prior to Russo's study, some had criticized the Iowa curves as being potentially obsolete because their development was rooted in the study of industrial property in existence during the early 1900s. Russo's research, however, negated this criticism by confirming that the Iowa curves represent a sufficiently wide range of life patterns, and that though technology will change over time, the underlying patterns of retirements remain constant and can be adequately described by the Iowa curves.[86]

Over the years, several more curve types have been added to Winfrey's 18 Iowa curves. In 1967, Harold Cowles added four origin-modal curves. In addition, a square curve is sometimes used to depict retirements which are all planned to occur at a given age. Finally,

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[85] *See* Wolf *supra* n. 6, at 37.

[86] *Id.*

analysts commonly rely on several "half curves" derived from the original Iowa curves. Thus, the term "Iowa curves" could be said to describe up to 31 standardized survivor curves.

2. <u>Classification</u>

The Iowa curves are classified by three variables: modal location, average life, and variation of life. First, the mode is the percent life that results in the highest point of the frequency curve and the "inflection point" on the survivor curve. The modal age is the age at which the greatest rate of retirement occurs. As illustrated in the figure below, the modes appear at the steepest point of each survivor curve in the top graph, as well as the highest point of each corresponding frequency curve in the bottom graph.

The classification of the survivor curves was made according to whether the mode of the retirement frequency curves was to the left, to the right, or coincident with average service life. There are three modal "families" of curves: six left modal curves (L0, L1, L2, L3, L4, L5); five right modal curves (R1, R2, R3, R4, R5); and seven symmetrical curves (S0, S1, S2, S3, S4, S5, S6).[87] In the figure below, one curve from each family is shown: L0, S3 and R1, with average life at 100 on the x-axis. It is clear from the graphs that the modes for the L0 and R1 curves appear to the left and right of average life respectively, while the S3 mode is coincident with average life.

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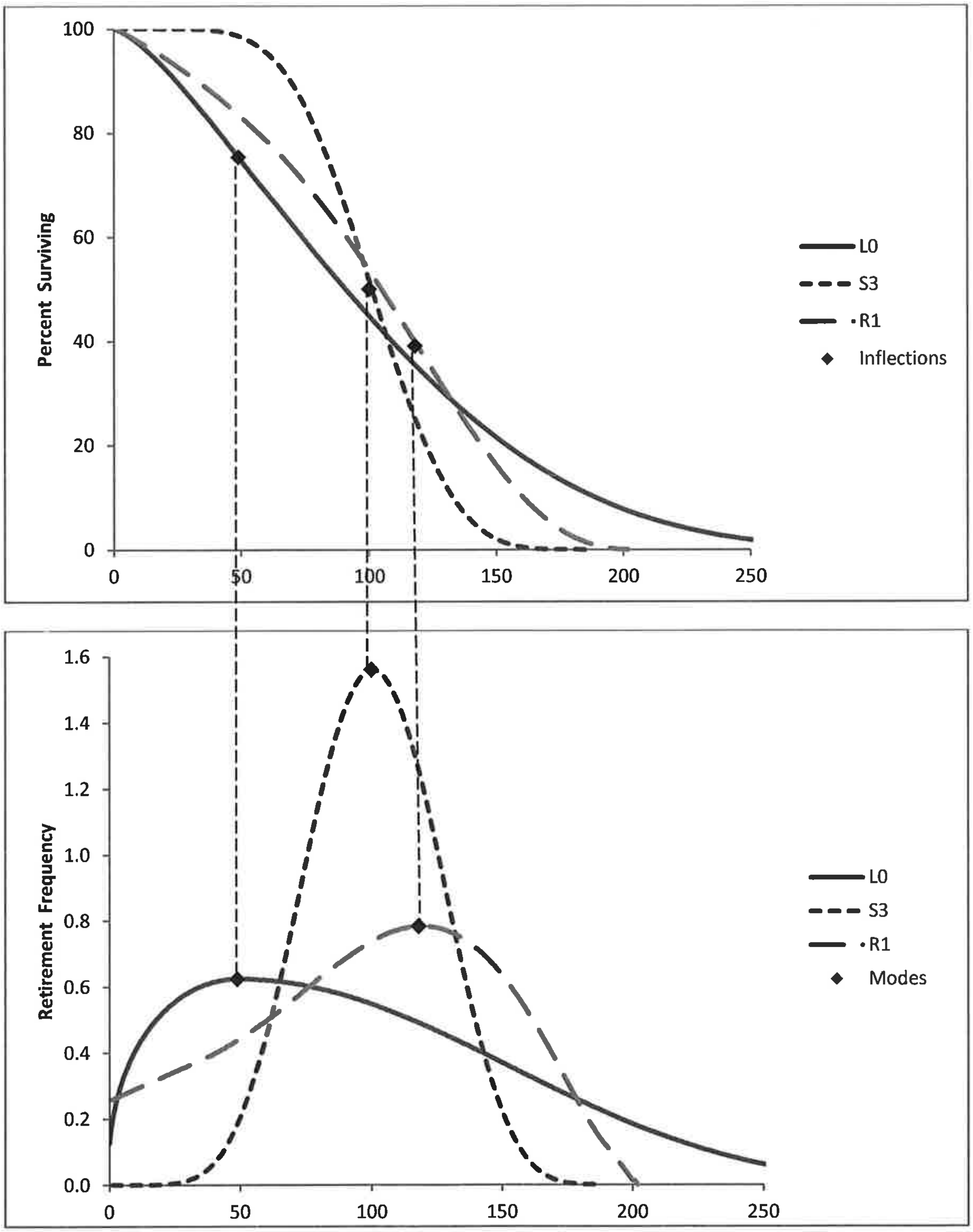
[87] In 1967, Harold A. Cowles added four origin-modal curves known as "O type" curves. There are also several "half" curves and a square curve, so the total amount of survivor curves commonly called "Iowa" curves is about 31 (see NARUC supra n. 7, at 68).

**Figure 14:
Modal Age Illustration**



The second Iowa curve classification variable is average life. The Iowa curves were designed using a single parameter of age expressed as a percent of average life instead of actual age. This was necessary in order for the curves to be of practical value. As Winfrey notes:

> Since the location of a particular survivor on a graph is affected by both its span in years and the shape of the curve, it is difficult to classify a group of curves unless one of these variables can be controlled. This is easily done by expressing the age in percent of average life."[88]

Because age is expressed in terms of percent of average life, any particular Iowa curve type can be modified to forecast property groups with various average lives.

The third variable, variation of life, is represented by the numbers next to each letter. A lower number (e.g., L1) indicates a relatively low mode, large variation, and large maximum life; a higher number (e.g., L5) indicates a relatively high mode, small variation, and small maximum life. All three classification variables – modal location, average life, and variation of life – are used to describe each Iowa curve. For example, a 13-L1 Iowa curve describes a group of property with a 13-year average life, with the greatest number of retirements occurring before (or to the left of) the average life, and a relatively low mode. The graphs below show these 18 survivor curves, organized by modal family.

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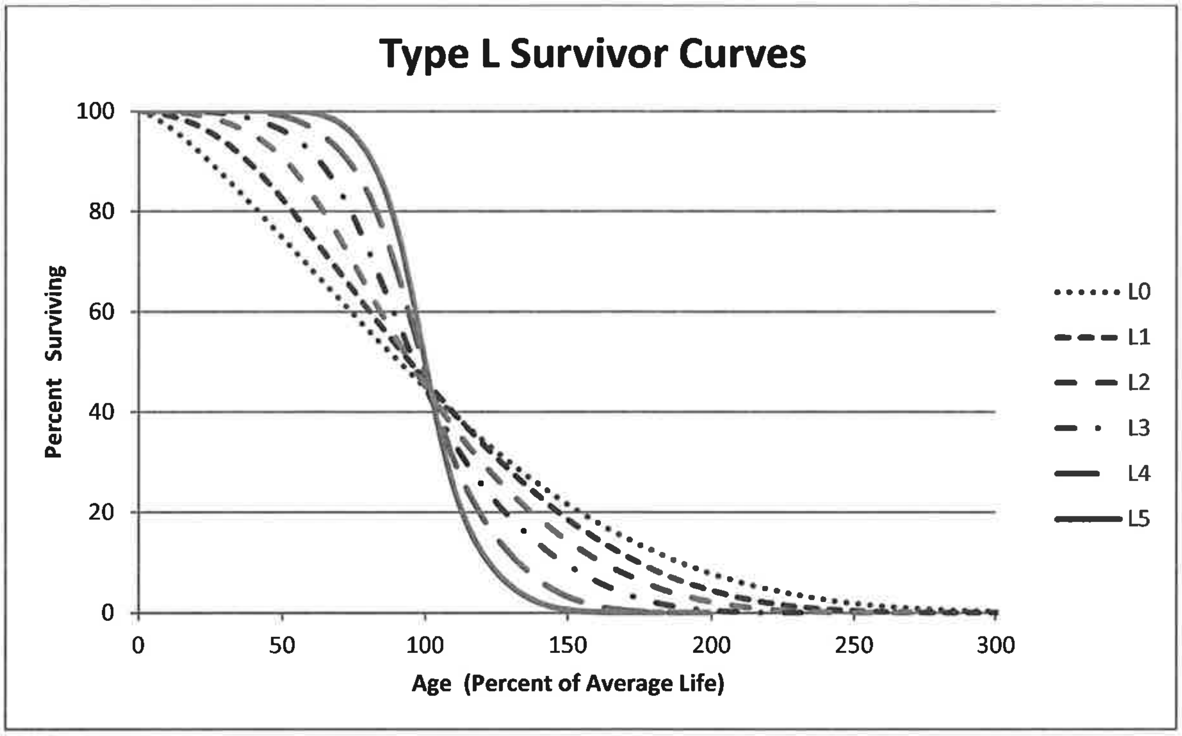
[88] Winfrey *supra* n. 75, at 60.

Figure 15:
Type L Survivor and Frequency Curves



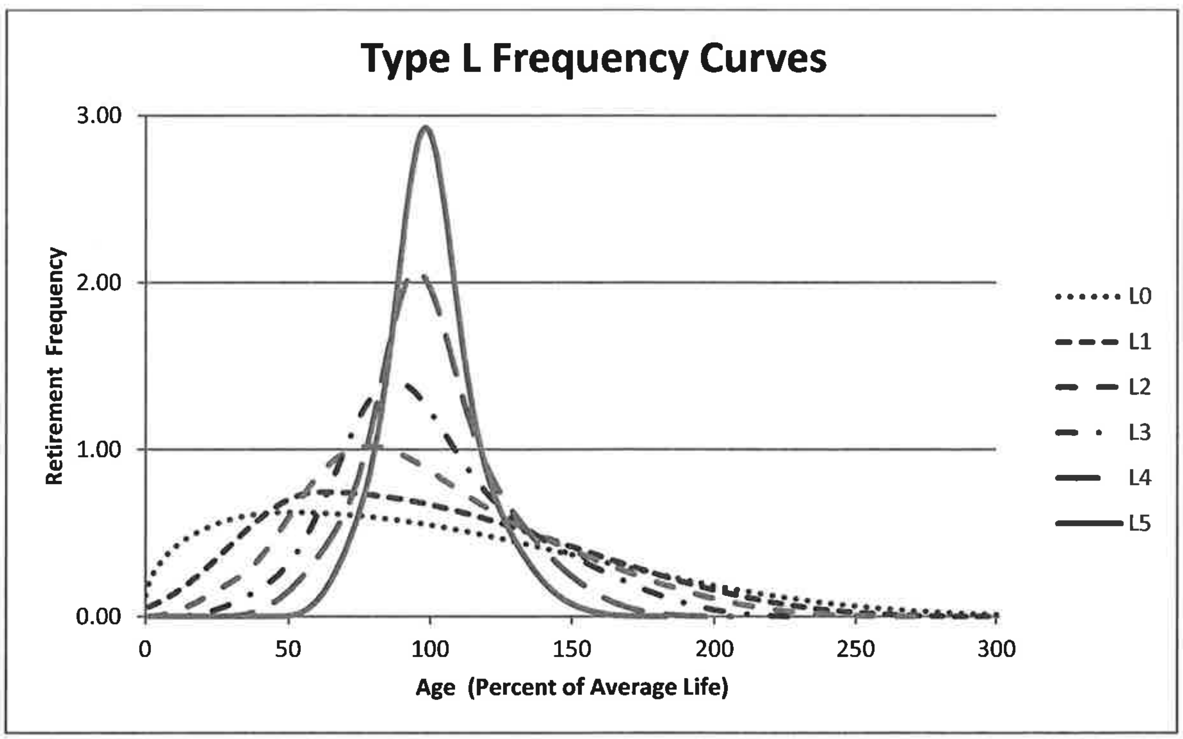
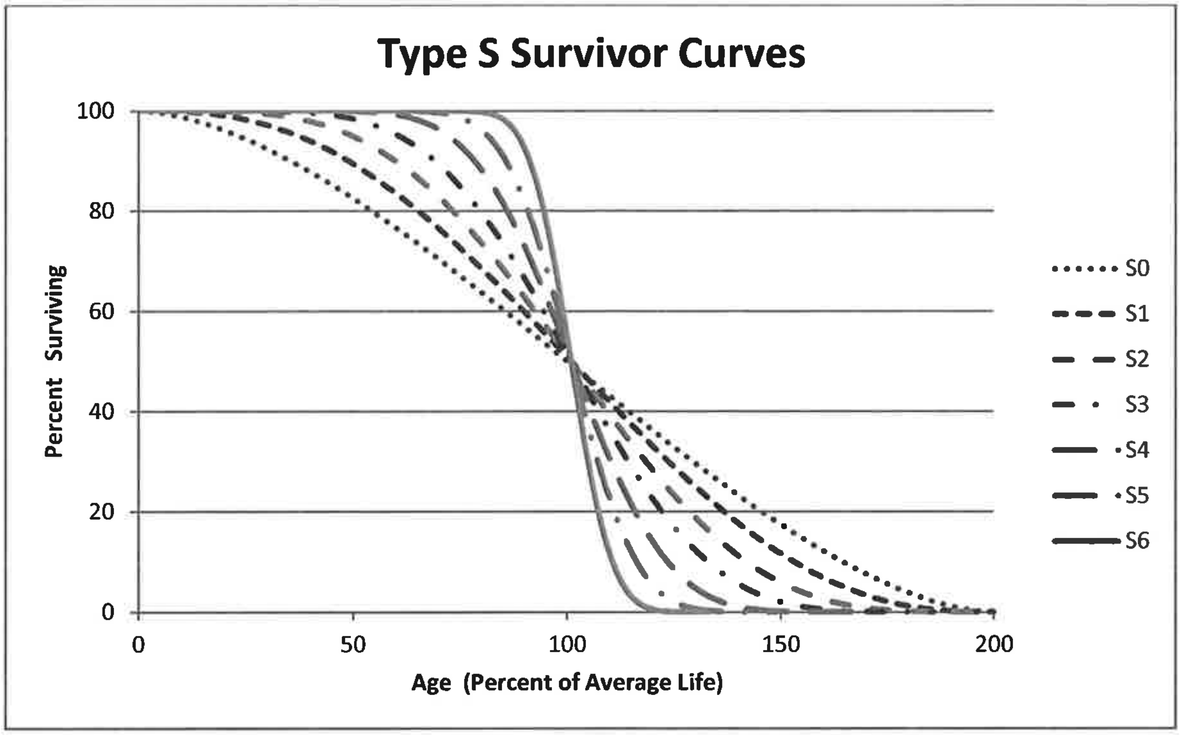


Figure 16:
Type S Survivor and Frequency Curves



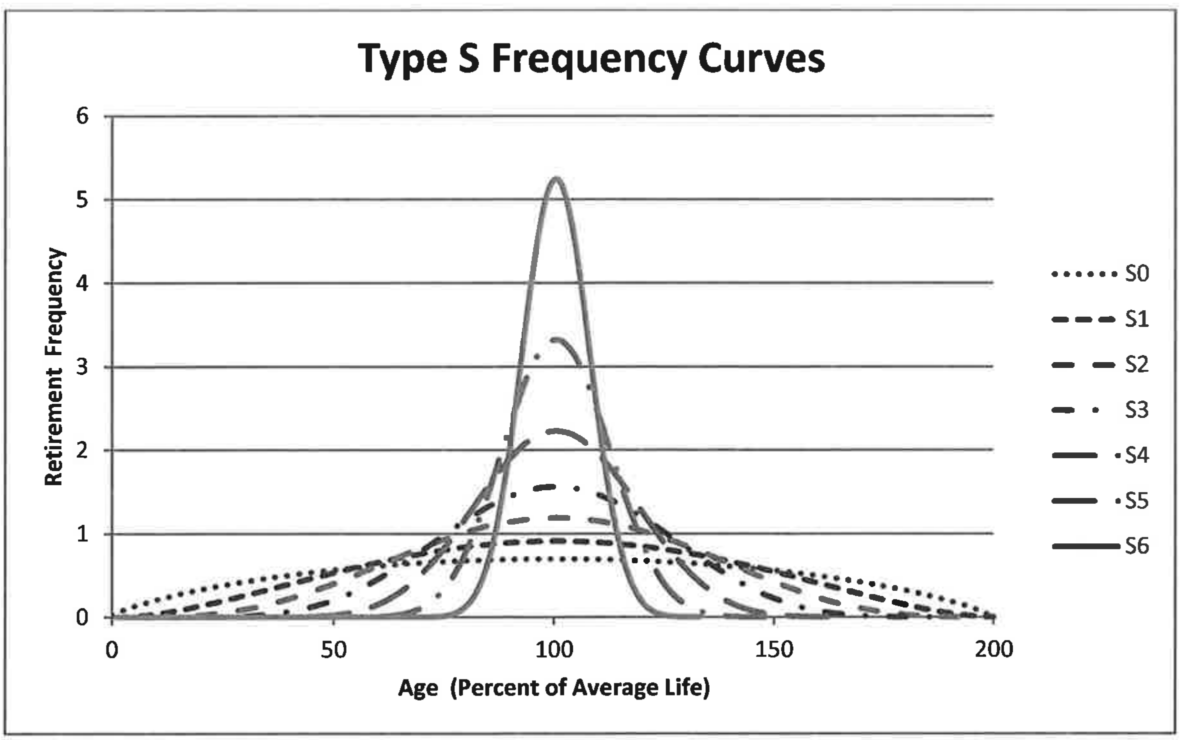
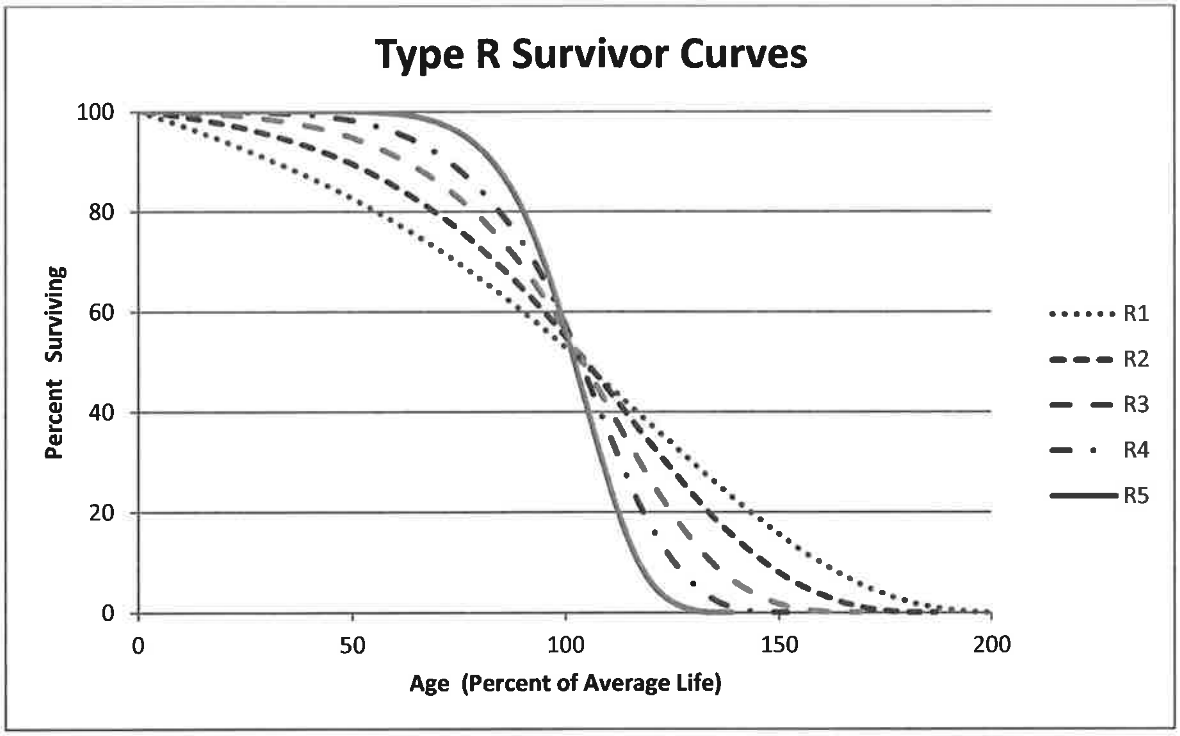
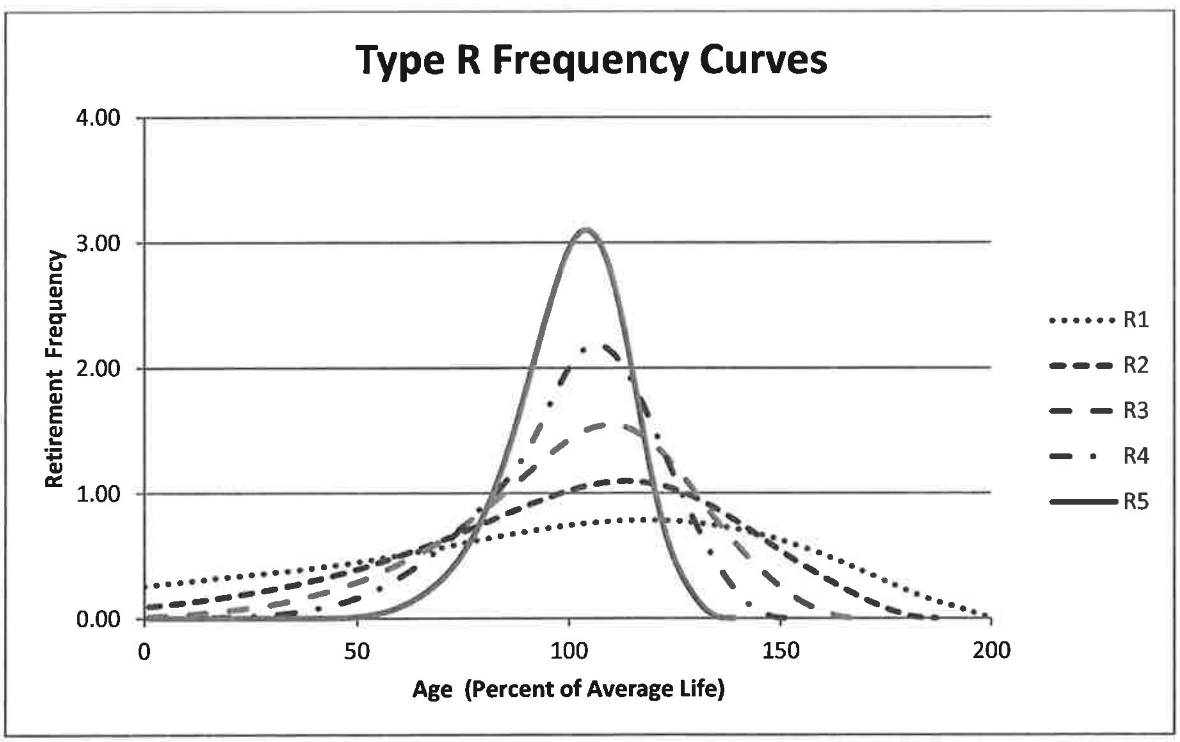


Figure 17:
Type R Survivor and Frequency Curves





As shown in the graphs above, the modes for the L family frequency curves occur to the left of average life (100% on the x-axis), while the S family modes occur at the average, and the R family modes occur after the average.

3. <u>Types of Lives</u>

Several other important statistical analyses and types of lives may be derived from an Iowa curve. These include: 1) average life; 2) realized life; 3) remaining life; and 4) probable life. Figure 8 below illustrates these concepts. It shows the frequency curve, survivor curve, and probable life curve. Age M_x on the x-axis represents the modal age, while age AL_x represents the average age. Thus, this figure illustrates an "L type" Iowa curve since the mode occurs before the average.[89]

First, average life is the area under the survivor curve from age zero to maximum life. Because the survivor curve is measured in percent, the area under the curve must be divided by 100% to convert it from percent-years to years. The formula for average life is as follows:[90]

Equation 4:
Average Life

$$Average\ Life = \frac{Area\ Under\ Survivor\ Curve\ from\ Age\ 0\ to\ Max\ Life}{100\%}$$

Thus, average life may not be determined without a complete survivor curve. Many property groups being analyzed will not have experienced full retirement. This results in a "stub"

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[89] From age zero to age M_x on the survivor curve, it could be said that the percent surviving from this property group is decreasing at an increasing rate. Conversely, from point M_x to maximum on the survivor curve, the percent surviving is decreasing at a decreasing rate.

[90] *See* NARUC *supra* n. 7, at 71.

survivor curve. Iowa curves are used to extend stub curves to maximum life in order for the average life calculation to be made (see Appendix C).

Realized life is similar to average life, except that realized life is the average years of service experienced to date from the vintage's original installations.[91] As shown in the figure below, realized life is the area under the survivor curve from zero to age RLx. Likewise, unrealized life is the area under the survivor curve from age RLx to maximum life. Thus, it could be said that average life equals realized life plus unrealized life.

Average remaining life represents the future years of service expected from the surviving property.[92] Remaining life is sometimes referred to as "average remaining life" and "life expectancy." To calculate average remaining life at age x, the area under the estimated future potion of the survivor curve is divided by the percent surviving at age x (denoted Sx). Thus, the average remaining life formula is:

Equation 5:
Average Remaining Life

$$Average\ Remaining\ Life = \frac{Area\ Under\ Survivor\ Curve\ from\ Age\ x\ to\ Max\ Life}{S_X}$$

It is necessary to determine average remaining life in order to calculate the annual accrual under the remaining life technique.

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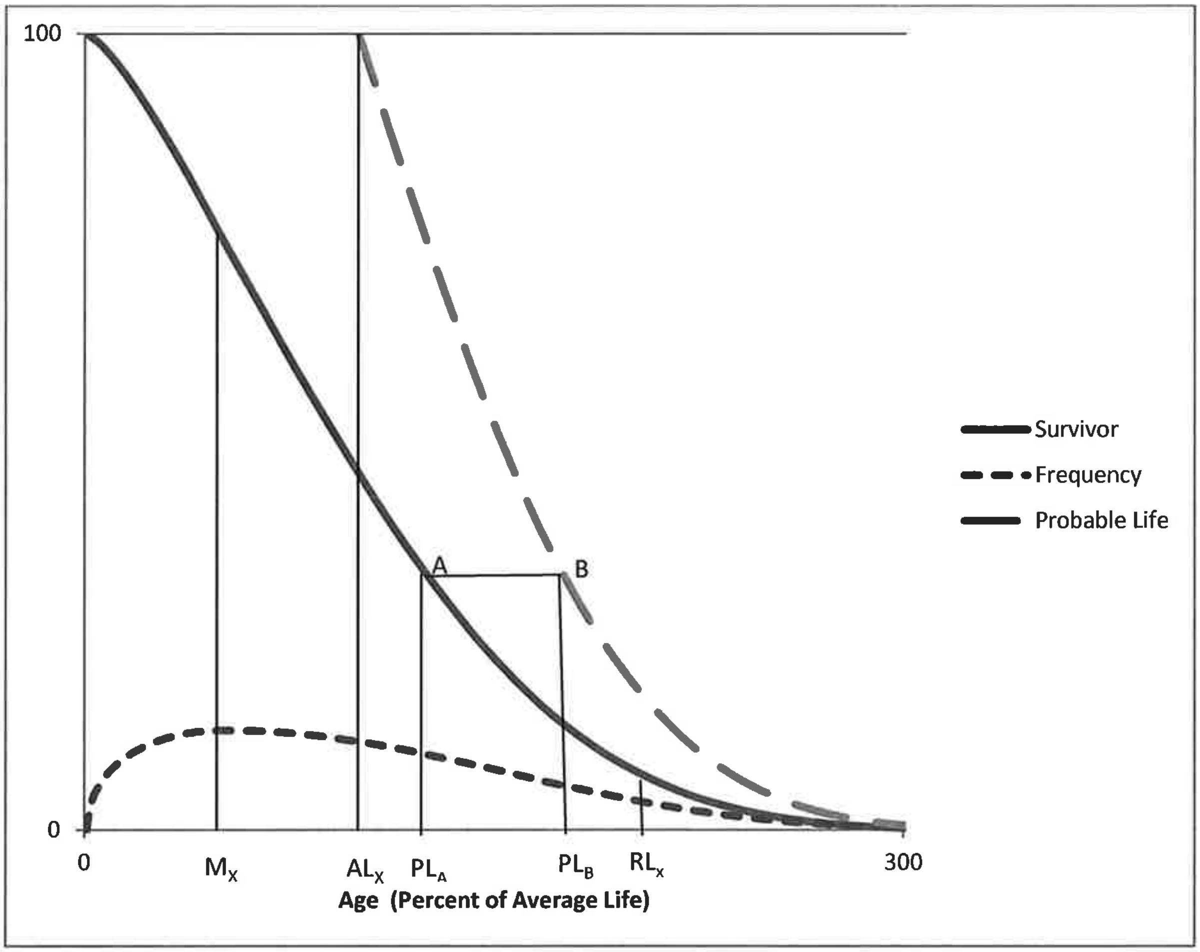
[91] *Id.* at 73.

[92] *Id.* at 74.

Figure 18:
Iowa Curve Derivations



Finally, the probable life may also be determined from the Iowa curve. The probable life of a property group is the total life expectancy of the property surviving at any age and is equal to the remaining life plus the current age.[93] The probable life is also illustrated in this figure. The probable life at age PL_A is the age at point PL_B. Thus, to read the probable life at age PL_A, see the

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[93] Wolf *supra* n. 6, at 28.

corresponding point on the survivor curve above at point "A," then horizontally to point "B" on the probable life curve, and back down to the age corresponding to point "B." It is no coincidence that the vertical line from AL_X connects at the top of the probable life curve. This is because at age zero, probable life equals average life.

APPENDIX C:
ACTUARIAL ANALYSIS

Actuarial science is a discipline that applies various statistical methods to assess risk probabilities and other related functions. Actuaries often study human mortality. The results from historical mortality data are used to predict how long similar groups of people who are alive will live today. Insurance companies rely of actuarial analysis in determining premiums for life insurance policies.

The study of human mortality is analogous to estimating service lives of industrial property groups. While some humans die solely from chance, most deaths are related to age; that is, death rates generally increase as age increases. Similarly, physical plant is also subject to forces of retirement. These forces include physical, functional, and contingent factors, as shown in the table below.[94]

Figure 19:
Forces of Retirement

Physical Factors	Functional Factors	Contingent Factors
Wear and tear Decay or deterioration Action of the elements	Inadequacy Obsolescence Changes in technology Regulations Managerial discretion	Casualties or disasters Extraordinary obsolescence

While actuaries study historical mortality data in order to predict how long a group of people will live, depreciation analysts must look at a utility's historical data in order to estimate the average lives of property groups. A utility's historical data is often contained in the

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[94] NARUC *supra* n. 7, at 14-15.

Continuing Property Records ("CPR"). Generally, a CPR should contain 1) an inventory of property record units; 2) the association of costs with such units; and 3) the dates of installation and removal of plant. Since actuarial analysis includes the examination of historical data to forecast future retirements, the historical data used in the analysis should not contain events that are anomalous or unlikely to recur.[95] Historical data is used in the retirement rate actuarial method, which is discussed further below.

The Retirement Rate Method

There are several systematic actuarial methods that use historical data in order to calculating observed survivor curves for property groups. Of these methods, the retirement rate method is superior, and is widely employed by depreciation analysts.[96] The retirement rate method is ultimately used to develop an observed survivor curve, which can be fitted with an Iowa curve discussed in Appendix B in order to forecast average life. The observed survivor curve is calculated by using an observed life table ("OLT"). The figures below illustrate how the OLT is developed. First, historical property data are organized in a matrix format, with placement years on the left forming rows, and experience years on the top forming columns. The placement year (a.k.a. "vintage year" or "installation year") is the year of placement of a group of property. The experience year (a.k.a. "activity year") refers to the accounting data for a particular calendar year. The two matrices below use aged data – that is, data for which the dates of placements, retirements, transfers, and other transactions are known. Without aged data, the retirement rate actuarial method may not be employed.

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[95] *Id.* at 112-13.

[96] Anson Marston, Robley Winfrey & Jean C. Hempstead, *Engineering Valuation and Depreciation* 154 (2nd ed., McGraw-Hill Book Company, Inc. 1953).

The first matrix is the exposure matrix, which shows the exposures at the beginning of each year.[97] An exposure is simply the depreciable property subject to retirement during a period. The second matrix is the retirement matrix, which shows the annual retirements during each year. Each matrix covers placement years 2003–2015, and experience years 2008-2015. In the exposure matrix, the number in the 2009 experience column and the 2003 placement row is $192,000. This means at the beginning of 2012, there was $192,000 still exposed to retirement from the vintage group placed in 2003. Likewise, in the retirement matrix, $19,000 of the dollars invested in 2003 was retired during 2012.

Figure 20:
Exposure Matrix

	Experience Years Exposures at January 1 of Each Year (Dollars in 000's)									
Placement Years	2008	2009	2010	2011	2012	2013	2014	2015	Total at Start of Age Interval	Age Interval
2003	261	245	228	211	**192**	173	152	131	131	11.5 - 12.5
2004	267	252	236	220	202	**184**	165	145	297	10.5 - 11.5
2005	304	291	277	263	248	232	**216**	198	536	9.5 - 10.5
2006	345	334	322	310	298	284	270	**255**	**847**	8.5 - 9.5
2007	367	357	347	335	324	312	299	286	1,201	7.5 - 8.5
2008	375	366	357	347	336	325	314	302	1,581	6.5 - 7.5
2009		377	366	356	346	336	327	319	1,986	5.5 - 6.5
2010			381	369	358	347	336	327	2,404	4.5 - 5.5
2011				386	372	359	346	334	2,559	3.5 - 4.5
2012					395	380	366	352	2,722	2.5 - 3.5
2013						401	385	370	2,866	1.5 - 2.5
2014							410	393	2,998	0.5 - 1.5
2015								416	3,141	0.0 - 0.5
Total	1919	2222	2514	2796	3070	3333	3586	3827	23,268	

[97] Technically, the last numbers in each column are "gross additions" rather than exposures. Gross additions do not include adjustments and transfers applicable to plant placed in a previous year. Once retirements, adjustments, and transfers are factored in, the balance at the beginning of the next account period is called an "exposure" rather than an addition.

Figure 21:
Retirement Matrix

Placement Years	2008	2009	2010	2011	2012	2013	2014	2015	Total During Age Interval	Age Interval
	Experience Years Retirments During the Year (Dollars in 000's)									
2003	16	17	18	19	**19**	20	21	23	23	11.5 - 12.5
2004	15	16	17	17	18	**19**	20	21	43	10.5 - 11.5
2005	13	14	14	15	16	17	**17**	18	59	9.5 - 10.5
2006	11	12	12	13	13	14	15	**15**	**71**	8.5 - 9.5
2007	10	11	11	12	12	13	13	14	82	7.5 - 8.5
2008	9	9	10	10	11	11	12	13	91	6.5 - 7.5
2009		11	10	10	9	9	9	8	95	5.5 - 6.5
2010			12	11	11	10	10	9	100	4.5 - 5.5
2011				14	13	13	12	11	93	3.5 - 4.5
2012					15	14	14	13	91	2.5 - 3.5
2013						16	15	14	93	1.5 - 2.5
2014							17	16	100	0.5 - 1.5
2015								18	112	0.0 - 0.5
Total	74	89	104	121	139	157	175	194	1,052	

These matrices help visualize how exposure and retirement data are calculated for each age interval. An age interval is typically one year. A common convention is to assume that any unit installed during the year is installed in the middle of the calendar year (i.e., July 1st). This convention is called the "half-year convention" and effectively assumes that all units are installed uniformly during the year.[98] Adoption of the half-year convention leads to age intervals of 0-0.5 years, 0.5-1.5 years, etc., as shown in the matrices.

The purpose of the matrices is to calculate the totals for each age interval, which are shown in the second column from the right in each matrix. This column is calculated by adding each number from the corresponding age interval in the matrix. For example, in the exposure matrix, the total amount of exposures at the beginning of the 8.5-9.5 age interval is $847,000. This number was calculated by adding the numbers shown on the "stairs" to the left (192+184+216+255=847).

[98] Wolf *supra* n. 6, at 22.

The same calculation is applied to each number in the column. The amounts retired during the year in the retirements matrix affect the exposures at the beginning of each year in the exposures matrix. For example, the amount exposed to retirement in 2008 from the 2003 vintage is $261,000. The amount retired during 2008 from the 2003 vintage is $16,000. Thus, the amount exposed to retirement in 2009 from the 2003 vintage is $245,000 ($261,000 - $16,000). The company's property records may contain other transactions which affect the property, including sales, transfers, and adjusting entries. Although these transactions are not shown in the matrices above, they would nonetheless affect the amount exposed to retirement at the beginning of each year.

The totaled amounts for each age interval in both matrices are used to form the exposure and retirement columns in the OLT, as shown in Figure 12 below. This figure also shows the retirement ratio and the survivor ratio for each age interval. The retirement ratio for an age interval is the ratio of retirements during the interval to the property exposed to retirement at the beginning of the interval. The retirement ratio represents the probability that the property surviving at the beginning of an age interval will be retired during the interval. The survivor ratio is simply the complement to the retirement ratio (1 – retirement ratio). The survivor ratio represents the probability that the property surviving at the beginning of an age interval will survive to the next age interval.

Figure 22:
Observed Life Table

Age at Start of Interval	Exposures at Start of Age Interval	Retirements During Age Interval	Retirement Ratio	Survivor Ratio	Percent Surviving at Start of Age Interval
A	B	C	D = C / B	E = 1 - D	F
0.0	3,141	112	0.036	0.964	**100.00**
0.5	2,998	100	0.033	0.967	**96.43**
1.5	2,866	93	0.032	0.968	**93.21**
2.5	2,722	91	0.033	0.967	**90.19**
3.5	2,559	93	0.037	0.963	**87.19**
4.5	2,404	100	0.042	0.958	**84.01**
5.5	1,986	95	0.048	0.952	**80.50**
6.5	1,581	91	0.058	0.942	**76.67**
7.5	1,201	82	0.068	0.932	**72.26**
8.5	847	71	0.084	0.916	**67.31**
9.5	536	59	0.110	0.890	**61.63**
10.5	297	43	0.143	0.857	**54.87**
11.5	131	23	0.172	0.828	**47.01**
					38.91
Total	23,268	1,052			

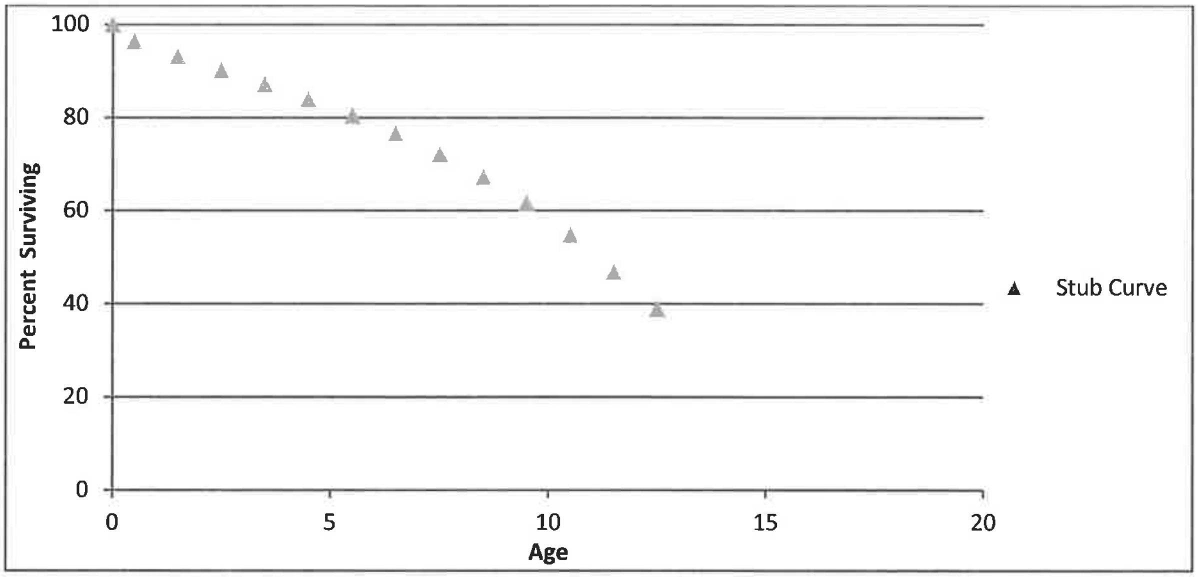
Column F on the right shows the percentages surviving at the beginning of each age interval. This column starts at 100% surviving. Each consecutive number below is calculated by multiplying the percent surviving from the previous age interval by the corresponding survivor ratio for that age interval. For example, the percent surviving at the start of age interval 1.5 is 93.21%, which was calculated by multiplying the percent surviving for age interval 0.5 (96.43%) by the survivor ratio for age interval 0.5 (0.967)[99].

The percentages surviving in Column F are the numbers that are used to form the original survivor curve. This particular curve starts at 100% surviving and ends at 38.91%

[99] Multiplying 96.43 by 0.967 does not equal 93.21 exactly due to rounding.

surviving. An observed survivor curve such as this that does not reach zero percent surviving is called a "stub" curve. The figure below illustrates the stub survivor curve derived from the OLT table above.

Figure 23:
Original "Stub" Survivor Curve



The matrices used to develop the basic OLT and stub survivor curve provide a basic illustration of the retirement rate method in that only a few placement and experience years were used. In reality, analysts may have several decades of aged property data to analyze. In that case, it may be useful to use a technique called "banding" in order to identify trends in the data.

<u>Banding</u>

The forces of retirement and characteristics of industrial property are constantly changing. A depreciation analyst may examine the magnitude of these changes. Analysts often use a technique called "banding" to assist with this process. Banding refers to the merging of several years of data into a single data set for further analysis, and it is a common technique associated with the retirement rate method.[100] There are three primary benefits of using bands in depreciation analysis:

1. Increasing the sample size. In statistical analyses, the larger the sample size in relation to the body of total data, the greater the reliability of the result;

2. Smooth the observed data. Generally, the data obtained from a single activity or vintage year will not produce an observed life table that can be easily fit; and

3. Identify trends. By looking at successive bands, the analyst may identify broad trends in the data that may be useful in projecting the future life characteristics of the property.[101]

Two common types of banding methods are the "placement band" method and the "experience band" method." A placement band, as the name implies, isolates selected placement years for analysis. The figure below illustrates the same exposure matrix shown above, except that only the placement years 2005-2008 are considered in calculating the total exposures at the beginning of each age interval.

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[100] NARUC *supra* n. 7, at 113.

[101] *Id.*

Figure 24:
Placement Bands

Placement Years	Experience Years – Exposures at January 1 of Each Year (Dollars in 000's) 2008	2009	2010	2011	2012	2013	2014	2015	Total at Start of Age Interval	Age Interval
2003	261	245	228	211	192	173	152	131		11.5 - 12.5
2004	267	252	236	220	202	184	165	145		10.5 - 11.5
2005	304	291	**277**	263	248	232	216	198	198	9.5 - 10.5
2006	345	334	322	**310**	298	284	270	255	471	8.5 - 9.5
2007	367	357	347	335	**324**	312	299	286	788	7.5 - 8.5
2008	375	366	357	347	336	**325**	314	302	1,133	6.5 - 7.5
2009		377	366	356	346	336	327	319	1,186	5.5 - 6.5
2010			381	369	358	347	336	327	**1,237**	4.5 - 5.5
2011				386	372	359	346	334	1,285	3.5 - 4.5
2012					395	380	366	352	1,331	2.5 - 3.5
2013						401	385	370	1,059	1.5 - 2.5
2014							410	393	733	0.5 - 1.5
2015								416	375	0.0 - 0.5
Total	1919	2222	2514	2796	3070	3333	3586	3827	9,796	

The shaded cells within the placement band equal the total exposures at the beginning of age interval 4.5–5.5 ($1,237). The same placement band would be used for the retirement matrix covering the same placement years of 2005 – 2008. This of course would result in a different OLT and original stub survivor curve than those that were calculated above without the restriction of a placement band.

Analysts often use placement bands for comparing the survivor characteristics of properties with different physical characteristics.[102] Placement bands allow analysts to isolate the effects of changes in technology and materials that occur in successive generations of plant. For example, if in 2005 an electric utility began placing transmission poles with a special chemical treatment that extended the service lives of the poles, an analyst could use placement bands to isolate and analyze the effect of that change in the property group's physical characteristics.

[102] Wolf *supra* n. 6, at 182.

While placement bands are very useful in depreciation analysis, they also possess an intrinsic dilemma. A fundamental characteristic of placement bands is that they yield fairly complete survivor curves for older vintages. However, with newer vintages, which are arguably more valuable for forecasting, placement bands yield shorter survivor curves. Longer "stub" curves are considered more valuable for forecasting average life. Thus, an analyst must select a band width broad enough to provide confidence in the reliability of the resulting curve fit, yet narrow enough so that an emerging trend may be observed.[103]

Analysts also use "experience bands." Experience bands show the composite retirement history for all vintages during a select set of activity years. The figure below shows the same data presented in the previous exposure matrices, except that the experience band from 2011 – 2013 is isolated, resulting in different interval totals.

Figure 25:
Experience Bands

	Experience Years Exposures at January 1 of Each Year (Dollars in 000's)									
Placement Years	2008	2009	2010	2011	2012	2013	2014	2015	Total at Start of Age Interval	Age Interval
2003	261	245	228	211	192	173	152	131		11.5 - 12.5
2004	267	252	236	220	202	184	165	145		10.5 - 11.5
2005	304	291	277	263	248	232	216	198	173	9.5 - 10.5
2006	345	334	322	310	298	284	270	255	376	8.5 - 9.5
2007	367	357	347	335	324	312	299	286	645	7.5 - 8.5
2008	375	366	357	347	336	325	314	302	752	6.5 - 7.5
2009		377	366	356	346	336	327	319	872	5.5 - 6.5
2010			381	369	358	347	336	327	959	4.5 - 5.5
2011				386	372	359	346	334	1,008	3.5 - 4.5
2012					395	380	366	352	1,039	2.5 - 3.5
2013						401	385	370	1,072	1.5 - 2.5
2014							410	393	1,121	0.5 - 1.5
2015								416	1,182	0.0 - 0.5
Total	1919	2222	2514	2796	3070	3333	3586	3827	9,199	

[103] NARUC *supra* n. 7, at 114.

The shaded cells within the experience band equal the total exposures at the beginning of age interval 4.5–5.5 ($1,237). The same experience band would be used for the retirement matrix covering the same experience years of 2011 – 2013. This of course would result in a different OLT and original stub survivor than if the band had not been used. Analysts often use experience bands to isolate and analyze the effects of an operating environment over time.[104] Likewise, the use of experience bands allows analysis of the effects of an unusual environmental event. For example, if an unusually severe ice storm occurred in 2013, destruction from that storm would affect an electric utility's line transformers of all ages. That is, each of the line transformers from each placement year would be affected, including those recently installed in 2012, as well as those installed in 2003. Using experience bands, an analyst could isolate or even eliminate the 2013 experience year from the analysis. In contrast, a placement band would not effectively isolate the ice storm's effect on life characteristics. Rather, the placement band would show an unusually large rate of retirement during 2013, making it more difficult to accurately fit the data with a smooth Iowa curve. Experience bands tend to yield the most complete stub curves for recent bands because they have the greatest number of vintages included. Longer stub curves are better for forecasting. The experience bands, however, may also result in more erratic retirement dispersion making the curve fitting process more difficult.

Depreciation analysts must use professional judgment in determining the types of bands to use and the band widths. In practice, analysts may use various combinations of placement and experience bands in order to increase the data sample size, identify trends and changes in life characteristics, and isolate unusual events.

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[104] *Id.*

Regardless of which bands are used, observed survivor curves in depreciation analysis rarely reach zero percent. This is because, as seen in the OLT above, relatively newer vintage groups have not yet been fully retired at the time the property is studied. An analyst could confine the analysis to older, fully retired vintage groups in order to get complete survivor curves, but such analysis would ignore some the property currently in service and would arguably not provide an accurate description of life characteristics for current plant in service. Because a complete curve is necessary to calculate the average life of the property group, however, curve fitting techniques using Iowa curves or other standardized curves may be employed in order to complete the stub curve.

Curve Fitting

Depreciation analysts typically use the survivor curve rather than the frequency curve to fit the observed stub curves. The most commonly used generalized survivor curves used in the curve fitting process are the Iowa curves discussed above. As Wolf notes, if "the Iowa curves are adopted as a model, an underlying assumption is that the process describing the retirement pattern is one of the 22 [or more] processes described by the Iowa curves."[105]

Curve fitting may be done through visual matching or mathematical matching. In visual curve fitting, the analyst visually examines the plotted data to make an initial judgment about the Iowa curves that may be a good fit. The figure below illustrates the stub survivor curve from Figure 13 above. It also shows three different Iowa curves: the 10-L4, the 10.5-R1, and the 10-S0. Visually, it is clear that the 10.5-R1 curve is a better fit than the other two curves.

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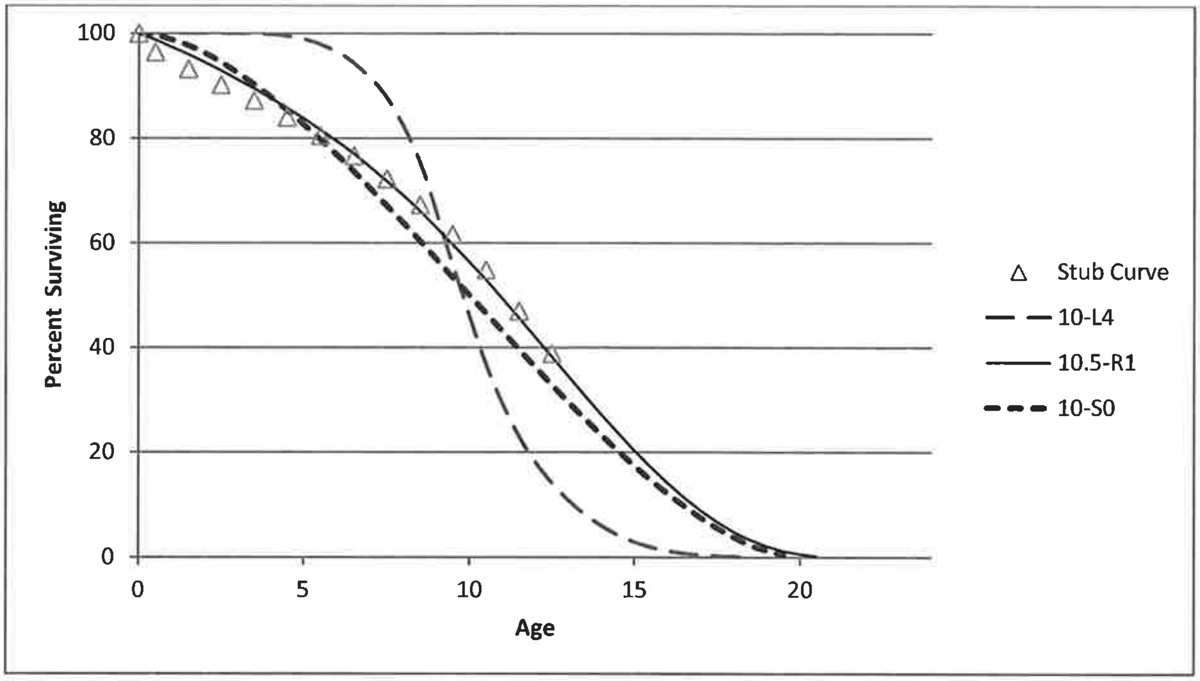
[105] Wolf *supra* n. 6, at 46 (22 curves includes Winfrey's 18 original curves plus Cowles's four "O" type curves).

Figure 26:
Visual Curve Fitting



In mathematical fitting, the least squares method is used to calculate the best fit. This mathematical method would be excessively time consuming if done by hand. With the use of modern computer software however, mathematical fitting is an efficient and useful process. The typical logic for a computer program, as well as the software employed for the analysis in this testimony is as follows:

> First (an Iowa curve) curve is arbitrarily selected. . . . If the observed curve is a stub curve, . . . calculate the area under the curve and up to the age at final data point. Call this area the realized life. Then systematically vary the average life of the theoretical survivor curve and calculate its realized life at the age corresponding to the study date. This trial and error procedure ends when you find an average life such that the realized life of the theoretical curve equals the realized life of the observed curve. Call this the average life.
>
> Once the average life is found, calculate the difference between each percent surviving point on the observed survivor curve and the corresponding point on the Iowa curve. Square each difference and sum them. The sum of squares is used as a measure of goodness of fit for that particular Iowa type curve. This procedure is

repeated for the remaining 21 Iowa type curves. The "best fit" is declared to be the type of curve that minimizes the sum of differences squared.[106]

Mathematical fitting requires less judgment from the analyst, and is thus less subjective. Blind reliance on mathematical fitting, however, may lead to poor estimates. Thus, analysts should employ both mathematical and visual curve fitting in reaching their final estimates. This way, analysts may utilize the objective nature of mathematical fitting while still employing professional judgment. As Wolf notes: "The results of mathematical curve fitting serve as a guide for the analyst and speed the visual fitting process. But the results of the mathematical fitting should be checked visually and the final determination of the best fit be made by the analyst."[107]

In Figure 16 above, visual fitting was sufficient to determine that the 10.5-R1 Iowa curve was a better fit than the 10-L4 and the 10-S0 curves. Using the sum of least squares method, mathematical fitting confirms the same result. In the figure below, the percentages surviving from the OLT that formed the original stub curve are shown in the left column, while the corresponding percentages surviving for each age interval are shown for the three Iowa curves. The right portion of the figure shows the differences between the points on each Iowa curve and the stub curve. These differences are summed at the bottom. Curve 10.5-R1 is the best fit because the sum of the squared differences for this curve is less than the same sum of the other two curves. Curve 10-L4 is the worst fit, which was also confirmed visually.

[106] Wolf *supra* n. 6, at 47.

[107] *Id.* at 48.

Figure 27:
Mathematical Fitting

Age Interval	Stub Curve	Iowa Curves			Squared Differences		
		10-L4	10-S0	10.5-R1	10-L4	10-S0	10.5-R1
0.0	100.0	100.0	100.0	100.0	0.0	0.0	0.0
0.5	96.4	100.0	99.7	98.7	12.7	10.3	5.3
1.5	93.2	100.0	97.7	96.0	46.1	19.8	7.6
2.5	90.2	100.0	94.4	92.9	96.2	18.0	7.2
3.5	87.2	100.0	90.2	89.5	162.9	9.3	5.2
4.5	84.0	99.5	85.3	85.7	239.9	1.6	2.9
5.5	80.5	97.9	79.7	81.6	301.1	0.7	1.2
6.5	76.7	94.2	73.6	77.0	308.5	9.5	0.1
7.5	72.3	87.6	67.1	71.8	235.2	26.5	0.2
8.5	67.3	75.2	60.4	66.1	62.7	48.2	1.6
9.5	61.6	56.0	53.5	59.7	31.4	66.6	3.6
10.5	54.9	36.8	46.5	52.9	325.4	69.6	3.9
11.5	47.0	23.1	39.6	45.7	572.6	54.4	1.8
12.5	38.9	14.2	32.9	38.2	609.6	36.2	0.4
SUM					3004.2	371.0	41.0

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EDUCATION

University of Oklahoma — Norman, OK
Master of Business Administration — 2014
Areas of Concentration: Finance, Energy

University of Oklahoma College of Law — Norman, OK
Juris Doctor — 2007
Member, American Indian Law Review

University of Oklahoma — Norman, OK
Bachelor of Business Administration — 2003
Major: Finance

PROFESSIONAL DESIGNATIONS

Society of Depreciation Professionals
Certified Depreciation Professional (CDP)

Society of Utility and Regulatory Financial Analysts
Certified Rate of Return Analyst (CRRA)

The Mediation Institute
Certified Civil / Commercial & Employment Mediator

WORK EXPERIENCE

Resolve Utility Consulting PLLC — Oklahoma City, OK
Managing Member — 08/2016 – Present
Provide expert analysis and testimony specializing in depreciation and cost of capital issues for clients in utility regulatory proceedings.

Oklahoma Corporation Commission — Oklahoma City, OK
Public Utility Regulatory Analyst — 02/2012 – 07/2016
Assistant General Counsel — 02/2011 – 01/2012
Represented commission staff in utility regulatory proceedings and provided legal opinions to commissioners. Provided expert analysis and testimony in depreciation, cost of capital, incentive compensation, payroll and other issues.

Perebus Counsel, PLLC — Oklahoma City, OK
Managing Member — 09/2009 – 01/2011
Represented clients in the areas of family law, estate planning, debt negotiations, business organization, and utility regulation.

Moricoli & Schovanec, P.C. — Oklahoma City, OK
Associate Attorney — 08/2007 – 08/2009
Represented clients in the areas of contracts, oil and gas, business structures and estate administration.

TEACHING EXPERIENCE

University of Oklahoma — Norman, OK
Adjunct Instructor – "Conflict Resolution" — 2014 – Present
Adjunct Instructor – "Ethics in Leadership"

Rose State College — Midwest City, OK
Adjunct Instructor – "Legal Research" — 2013 – 2015
Adjunct Instructor – "Oil & Gas Law"

PUBLICATIONS

American Indian Law Review — Norman, OK
"Vine of the Dead: Reviving Equal Protection Rites for Religious Drug Use" — 2006
(31 Am. Indian L. Rev. 143)

VOLUNTEER EXPERIENCE

Calm Waters — Oklahoma City, OK
Board Member — 2015 – Present
Participate in management of operations, attend meetings, review performance, compensation, and financial records. Assist in fundraising events.

Group Facilitator & Fundraiser — 2014 – Present
Facilitate group meetings designed to help children and families cope with divorce and tragic events. Assist in fundraising events.

St. Jude Children's Research Hospital — Oklahoma City, OK
Oklahoma Fundraising Committee — 2008 – 2010
Raised money for charity by organizing local fundraising events.

PROFESSIONAL ASSOCIATIONS

Oklahoma Bar Association — 2007 – Present

Society of Depreciation Professionals 2014 – Present
Board Member – Vice President 2016
Participate in management of operations, attend meetings, review performance, organize presentation agenda.

Society of Utility Regulatory Financial Analysts 2014 – Present

CONTINUING PROFESSIONAL EDUCATION

Society of Depreciation Professionals — New Orleans, LA
"Introduction to Depreciation" and "Extended Training" — 2014
Week-long training seminar with extensive instruction on utility depreciation, including average lives and net salvage.

Society of Utility and Regulatory Financial Analysts — Indianapolis, IN
46th Financial Forum. "The Regulatory Compact: Is it Still Relevant?" — 2014
Forum discussions on current issues.

Energy Management Institute — Houston, TX
"Fundamentals of Power Trading" — 2013
Instruction and practical examples on the power market complex, as well as comprehensive training on power trading.

New Mexico State University, Center for Public Utilities — Santa Fe, NM
Current Issues 2012, "The Santa Fe Conference" — 2012
Forum discussions on various current issues in utility regulation.

Energy Management Institute — Houston, TX
"Introduction to Energy Trading and Hedging" — 2012
Instruction in energy trading and hedging, including examination of various trading instruments and techniques.

Michigan State University, Institute of Public Utilities — Clearwater, FL
"39th Eastern NARUC Utility Rate School" — 2011
One-week, hands-on training emphasizing the fundamentals of the utility ratemaking process.

New Mexico State University, Center for Public Utilities — Albuquerque, NM
"The Basics: Practical Regulatory Training for the Changing Electric Industries" — 2010
One-week, hands-on training designed to provide a solid foundation in core areas of utility ratemaking.

The Mediation Institute — Oklahoma City, OK
"Civil / Commercial & Employment Mediation Training" — 2009
Extensive instruction and mock mediations designed to build foundations in conducting mediations in civil matters.

EXPERIENCE IN REGULATORY PROCEEDINGS

1. **Sierra Pacific Power Company, 2016** (Docket No. 16-06008) – Testified on depreciation rates and related issues.

2. **Oklahoma Gas and Electric Company, 2016** (Cause No. PUD 15-273) – Testified on cost of capital, capital structure, and depreciation rates.

3. **Public Service Company of Oklahoma, 2015** (Cause No. PUD 15-208) – Testified on cost of capital, capital structure, and depreciation rates.

4. **Oklahoma Natural Gas Company, 2015** (Cause No. PUD 15-213) – Testified on cost of capital, capital structure, and depreciation rates.

5. **Oak Hills Water System, Inc.** (Cause No. PUD 15-123) – Testified on cost of capital, capital structure, and depreciation rates.

6. **CenterPoint Energy Oklahoma Gas, 2014** (Cause No. PUD 14-227) – Testified on prudence of fuel-related costs and process in annual fuel audit and prudence review.

7. **Public Service Company of Oklahoma, 2014** (Cause No. PUD 14-233) – Testified on PSO's application for a certificate of authority to issue new debt securities.

8. **Empire District Electric Company, 2014** (Cause No. PUD 14-226) – Testified on prudence of fuel-related costs and process in annual fuel audit and prudence review.

9. **Fort Cobb Fuel Authority, 2014** (Cause No. PUD 14-219) – Testified on prudence of fuel-related costs and process in annual fuel audit and prudence review.

10. **Fort Cobb Fuel Authority, 2014** (Cause No. PUD 14-140) – Testified in FCFA's application for a rate increase on outside services, legislative advocacy, miscellaneous taxes, payroll expense and taxes, employee insurance expense, and insurance expense.

11. **Public Service Company of Oklahoma, 2013** (Cause No. PUD 13-217) – Lead auditor of PSO's application for a rate increase. Provided additional research support for cost of capital issue. Assisted in coordination of PUD staff analysts and issues.

12. **Public Service Company of Oklahoma, 2013** (Cause No. PUD 13-201) – Testified in PSO's application for authorization of a standby and supplemental service tariff.

13. **Fort Cobb Fuel Authority, 2013** (Cause No. PUD 13-134) – Testified on prudence of fuel-related costs and process in annual fuel audit and prudence review.

14. **Empire District Electric Company, 2013** (Cause No. PUD 13-131) – Testified on prudence of fuel-related costs and process in annual fuel audit and prudence review.

15. **CenterPoint Energy Oklahoma Gas, 2013** (Cause No. PUD 13-127) – Testified on prudence of fuel-related costs and process in annual fuel audit and prudence review.

16. **Oklahoma Gas & Electric Company, 2012** (Cause No. PUD 12-185) – Testified in OG&E's application for extension of a gas transportation contract.

17. **Empire District Electric Company, 2012** (Cause No. PUD 12-170) – Testified on prudence of fuel-related costs and process in annual fuel audit and prudence review.

18. **Oklahoma Gas & Electric Company, 2012** (Cause No. PUD 12-169) – Testified on prudence of fuel-related costs and process in annual fuel audit and prudence review.

Summary Adjustment

Summary Rate and Accrual Comparison

	[1]	[2]		[3]		[4]
Plant Function	Original Cost 5/31/2016	SPPC Proposal Rate	SPPC Proposal Accrual	NNUC Proposal Rate	NNUC Proposal Accrual	NNUC Adjustment
Intangible Plant	$ 27,080,767	10.0%	$ 2,707,000	1.9%	$ 509,735	$ (2,197,265)
Steam Production	540,758,017	4.8%	25,903,967	4.8%	25,903,967	-
Other Production	597,161,843	3.7%	22,049,785	3.1%	18,758,064	(3,094,448)
Transmission	725,151,493	1.9%	14,018,520	1.7%	12,074,638	(1,435,596)
Distribution	1,401,671,198	2.3%	31,766,075	1.9%	25,963,707	(5,802,367)
General	102,069,787	6.2%	6,376,477	6.2%	6,360,750	(14,680)
Common	217,033,331	7.3%	15,864,411	3.9%	8,445,095	(6,925,635)
Total	$ 3,610,926,436	3.29%	$ 118,686,234	2.71%	$ 98,015,956	**$ (19,469,991)**

[1] Total adjusted plant at 5-31-16 from I-CERT-12.2

[2] SPPC proposed rates (see DJG 3)

[3] NNUC proposed rates and depreciation expense from DJG 3

[4] NNUC adjustment from DJG 3 applied to Nevada jurisdictional percentages

Detailed Adjustment

(000's except totals)

		[1]	[2]		[3]		[4]		[5]	
			SPPC Proposed Rates		NNUC Proposed Rates		Total Adjustment		Nevada Jurisdictional	
Account No.	Description	Plant Balance 5/31/2016	Rate	Annual Accrual	Rate	Annual Accrual	Rate	Annual Accrual	Percent	Adjustment
	Intangible Plant									
301.00	Organization	$ 26	0.00%	$ -	0.00%	$ -	0.00%	$ -		
302.00	Franchises & Consents	0	0.00%	-	0.00%	-	0.00%	-		
303.00	Software	27,055	3.43%	2,707	1.88%	510	-1.55%	(2,197)		
	Total Intangible Plant	27,081	10.00%	2,707	1.88%	510		(2,197)	100.00%	(2,197)
	Steam Production Plant									
310.10	Land	1,025	0.00%	-	0.00%	-	0.00%	-		
310.20	Land Rights	566	4.55%	26	4.55%	26	0.00%	-		
311.00	Structures and Improvements	85,868	3.96%	3,400	3.96%	3,400	0.00%	-		
312.00	Boiler Plant Equipment	298,404	5.52%	16,472	5.52%	16,472	0.00%	-		
314.00	Turbogenerator Units	92,996	4.75%	4,417	4.75%	4,417	0.00%	-		
315.00	Accessory Electric Equipment	50,413	2.11%	1,064	2.11%	1,064	0.00%	-		
316.00	Miscellaneous Power Plant Equipment	11,486	4.57%	525	4.57%	525	0.00%	-		
317.00	ARO Steam Production	-	0.00%	-	0.00%	-	0.00%	-		
	Total Steam Production Plant	540,758	4.79%	25,904	4.79%	25,904		-		-
	Other Production Plant									
340.10	Land	17	0.00%	-	0.00%	-	0.00%	-		
340.20	Land Rights	-	0.00%	-	0.00%	-	0.00%	-		
341.00	Structures and Improvements	44,715	3.84%	1,717	3.16%	1,414	-0.68%	(303)		
342.00	Fuel Holders, Producers and Accessories	107,284	3.14%	3,369	2.49%	2,674	-0.65%	(695)		
343.00	Prime Movers	20,191	4.10%	828	4.09%	826	-0.01%	(1)		
344.00	Generators	322,813	3.91%	12,622	3.33%	10,736	-0.58%	(1,886)		
345.00	Accessory Electric Equipment	67,461	3.23%	2,179	2.92%	1,972	-0.31%	(207)		
346.00	Miscellaneous Power Plant Equipment	34,680	3.85%	1,335	3.28%	1,136	-0.57%	(199)		
347.00	ARO Other Production	-	0.00%	-	0.00%	-	0.00%	-		
	Total Other Production Plant	597,162	3.69%	22,050	3.14%	18,758		(3,292)	94.01%	(3,094)
	Transmission Plant									
350.10	Land	1,527	0.00%	-	0.00%	-	0.00%	-		
350.20	Land Rights	49,174	1.40%	688	1.01%	496	-0.39%	(192)		
352.00	Structures and Improvements	19,539	1.99%	389	1.54%	301	-0.45%	(88)		
353.00	Station Equipment	251,945	1.94%	4,888	1.84%	4,628	-0.10%	(260)		
354.00	Towers and Fixtures	130,976	1.32%	1,729	1.36%	1,784	0.04%	55		
355.00	Poles and Fixtures	85,977	2.37%	2,038	1.69%	1,453	-0.68%	(585)		
355.00	CWIP Property Taxes	1,690	2.37%	40	1.69%	29	-0.68%	(11)		
356.00	Overhead Conductors and Devices	161,261	2.37%	3,822	1.84%	2,970	-0.53%	(852)		
356.00	CWIP Property Taxes	1,690	2.37%	40	1.84%	31	-0.53%	(9)		
357.00	Underground Conduit	8,507	1.69%	144	1.69%	144	0.00%	0		
358.00	Underground Conductors and Devices	12,418	1.90%	236	1.91%	237	0.01%	1		
359.00	Roads and Trails	447	1.18%	5	0.73%	3	-0.45%	(2)		
	Total Transmission Plant	725,151	1.93%	14,019	1.67%	12,075		(1,944)	73.85%	(1,436)
	Distribution Plant									
360.10	Land	4,397	0.00%	-	0.00%	-	0.00%	-		
360.20	Land Rights	10,947	1.49%	163	0.88%	96	-0.61%	(67)		
361.00	Structures and Improvements	3,129	1.94%	61	1.07%	33	-0.87%	(27)		
362.00	Station Equipment	208,240	1.51%	3,144	1.32%	2,741	-0.19%	(404)		
364.00	Poles, Towers and Fixtures	176,741	2.79%	4,931	2.10%	3,704	-0.69%	(1,227)		
364.00	CWIP Property Taxes	3,231	2.79%	90	2.79%	90	0.00%	-		
365.00	Overhead Conductors and Devices	141,653	2.70%	3,825	2.49%	3,533	-0.21%	(292)		
365.00	CWIP Property Taxes	3,249	2.70%	88	2.70%	88	0.00%	-		
366.00	Underground Conduit	80,134	1.43%	1,146	1.25%	1,000	-0.18%	(146)		
367.00	Underground Conductors and Devices	325,699	2.24%	7,296	1.68%	5,485	-0.56%	(1,810)		
368.00	Transformers	216,431	2.41%	5,216	1.85%	4,007	-0.56%	(1,209)		
368.00	CWIP Property Taxes	3,249	2.41%	78	2.41%	78	0.00%	-		
369.00	Services	135,901	1.75%	2,378	1.29%	1,759	-0.46%	(620)		
370.00	Meters	4,472	5.10%	228	5.10%	228	0.00%	-		
370.10	Meters - AMI	36,998	5.10%	1,887	5.10%	1,887	0.00%	-		
371.00	Installations on Customer Premises	7,475	1.75%	131	1.75%	131	0.00%	-		
373.00	Street Lighting and Signal Systems	39,726	2.78%	1,104	2.78%	1,104	0.00%	-		
374.00	ARO Distribution	-	0.00%	-	0.00%	-	0.00%	-		
	Total Distribution Plant	1,401,671	2.27%	31,766	1.85%	25,964		(5,802)	100.00%	(5,802)
	General Plant									
389.10	Land	1,531	0.00%	-	0.00%	-	0.00%	-		
389.20	Land Rights	129	1.50%	2	1.50%	2	0.00%	-		
390.00	Structures and Improvements	21,285	1.52%	324	1.45%	308	-0.07%	(16)		
391.10	Office Furniture and Equipment	1,694	5.00%	85	5.00%	85	0.00%	-		
391.20	Computer Equipment	6,801	20.00%	1,360	20.00%	1,360	0.00%	-		
392.00	Transportation Equipment	-	5.55%	-	5.55%	-	0.00%	-		
393.00	Stores Equipment	7	5.00%	0	5.00%	0	0.00%	-		
394.00	Tools, Shop and Garage Equipment	4,192	4.00%	168	4.00%	168	0.00%	-		
395.00	Laboratory Equipment	827	6.67%	55	6.67%	55	0.00%	-		
396.00	Power Operated Equipment	-	4.27%	-	4.27%	-	0.00%	-		
397.00	Communication Equipment	65,551	6.67%	4,372	6.67%	4,372	0.00%	-		
398.00	Miscellaneous Equipment	53	20.00%	11	20.00%	11	0.00%	-		
399.00	ARO General	-	0.00%	-	0.00%	-	0.00%	-		
	Total General Plant	102,070	6.25%	6,376	6.23%	6,361		(16)	93.35%	(15)
	Common Plant									

Detailed Adjustment

(000's except totals)

		[1]	[2]		[3]		[4]		[5]	
			SPPC Proposed Rates		NNUC Proposed Rates		Total Adjustment		Nevada Jurisdictional	
Account No.	Description	Plant Balance 5/31/2016	Rate	Annual Accrual	Rate	Annual Accrual	Rate	Annual Accrual	Percent	Adjustment
303.00	Software	96,752	5.74%	9,790	3.17%	2,558	-2.57%	(7,232)		
389.10	Land	9,336	0.00%	-	0.00%	-	0.00%	-		
389.20	Land Rights	280	0.78%	2	0.78%	2	0.00%	-		
390.00	Structures and Improvements	58,264	1.90%	925	1.52%	737	-0.38%	(187)		
391.10	Office Furniture and Equipment	10,594	5.00%	442	5.00%	442	0.00%	-		
391.20	Common Computers	21,457	20.00%	3,584	20.00%	3,584	0.00%	-		
392.00	Transportation Equipment	-	3.81%	-	3.81%	-	0.00%	-		
393.00	Stores Equipment	-	0.00%	-	0.00%	-	0.00%	-		
394.00	Tools, Shop and Garage Equipment	546	4.00%	18	4.00%	18	0.00%	-		
395.00	Laboratory Equipment	-	0.00%	-	3.95%	-	3.95%	-		
396.00	Power Operated Equipment	-	3.95%	-	6.67%	-	2.72%	-		
397.00	Communication Equipment	19,794	6.67%	1,103	6.67%	1,103	0.00%	-		
398.00	Miscellaneous Equipment	12	6.67%	1	6.67%	1	0.00%	-		
	Total Common Plant	217,033	7.31%	15,864	3.89%	8,445		(7,419)	93.35%	(6,926)
	TOTAL DEPRECIABLE PLANT	$ 3,610,926,436		$ 118,686,234		$ 98,015,956		$ (20,670,278)		$ (19,469,991)

[1] Total adjusted plant at 5-31 16 from I-CERT-12.2
[2] Proposed depreciation rates from 2016 Depreciation Study multiplied by plant balances to get the annual accrual (or depreciation expense) except for Account 303 in common plant, which was hard coded from Schedule I-CERT-12A
[3] Proposed rates and corresponding accruals from DJG 5 multiplied by plant balances to get accrual rates; Common plant multiplied by electric allocation from Schedule I-CERT-12A
[4] = [3] - [2]
[5] Nevada jurisdictional percentages I-CERT-12A and corresponding adjustment.

Detailed Rate Comparison

(as of study date)

		[1]	[2]		[3]		[4]	
			SPPC Proposed Rates		NNUC Proposed Rates		Difference	
Account No.	Description	Original Cost	Rate	Annual Accrual	Rate	Annual Accrual	Rate	Annual Accrual
	Intangible Plant							
303.00	Software	27,453,346	3.43%	940,336	1.88%	517,250	-1.54%	-423,086
	Total Intangible Plant	27,453,346	3.43%	940,336	1.88%	517,250	-1.54%	-423,086
	Steam Production Plant							
310.20	Land Rights							
	FT Churchill Common	46,092	4.91%	2,265	4.91%	2,265	0.00%	0
	Valmy Unit 1	10,000	0.00%	-	0.00%	0	0.00%	0
	Valmy Unit 2	307,211	6.85%	21,035	6.85%	21,035	0.00%	0
	Tracy Common	203,037	1.20%	2,445	1.20%	2,445	0.00%	0
	Total Land Rights	566,340	4.55%	25,745	4.55%	25,745	0.00%	0
311.00	Structures and Improvements							
	FT Churchill Unit 1	2,914,707	2.13%	62,071	2.13%	62,071	0.00%	0
	FT Churchill Unit 2	2,448,286	1.02%	25,076	1.02%	25,076	0.00%	0
	FT Churchill Common	3,973,293	2.70%	107,323	2.70%	107,323	0.00%	0
	Tracy Unit 3	2,321,999	1.07%	24,906	1.07%	24,906	0.00%	0
	Tracy Common	4,455,013	2.89%	128,762	2.89%	128,762	0.00%	0
	Valmy Unit 1	24,441,824	2.92%	714,247	2.92%	714,247	0.00%	0
	Valmy Unit 2	43,314,701	5.21%	2,258,123	5.21%	2,258,123	0.00%	0
	Total Structures and Improvements	83,869,823	3.96%	3,320,508	3.96%	3,320,508	0.00%	0
312.00	Boiler Plant Equipment							
	FT Churchill Unit 1	20,707,402	6.50%	1,345,095	6.50%	1,345,095	0.00%	0
	FT Churchill Unit 2	18,760,977	5.84%	1,094,950	5.84%	1,094,950	0.00%	0
	FT Churchill Common	2,599,302	5.67%	147,322	5.67%	147,322	0.00%	0
	Tracy Unit 3	31,305,325	4.61%	1,443,906	4.61%	1,443,906	0.00%	0
	Tracy Common	2,635,818	5.77%	152,036	5.77%	152,036	0.00%	0
	Valmy Unit 1	81,162,832	4.79%	3,890,924	4.79%	3,890,924	0.00%	0
	Valmy Unit 2	137,572,126	5.96%	8,205,129	5.96%	8,205,129	0.00%	0
	Total Boiler Plant Equipment	294,743,783	5.52%	16,279,362	5.52%	16,279,362	0.00%	0
314.00	Turbogenerator Units							
	FT Churchill Unit 1	8,048,178	3.16%	254,470	3.16%	254,470	0.00%	0
	FT Churchill Unit 2	12,812,584	3.17%	405,881	3.17%	405,881	0.00%	0
	FT Churchill Common	147,858	3.56%	5,270	3.56%	5,270	0.00%	0
	Tracy Unit 3	10,771,303	1.41%	152,038	1.41%	152,038	0.00%	0
	Tracy Common	371,594	1.29%	4,785	1.29%	4,785	0.00%	0
	Valmy Unit 1	24,638,579	4.88%	1,202,377	4.88%	1,202,377	0.00%	0
	Valmy Unit 2	32,317,990	6.83%	2,208,255	6.83%	2,208,255	0.00%	0
	Total Turbogenerator Units	89,108,087	4.75%	4,233,076	4.75%	4,233,076	0.00%	0
315.00	Accessory Electric Equipment							
	FT Churchill Unit 1	1,633,199	2.45%	39,936	2.45%	39,936	0.00%	0
	FT Churchill Unit 2	1,514,744	0.20%	3,079	0.20%	3,079	0.00%	0
	FT Churchill Common	1,383,087	4.93%	68,239	4.93%	68,239	0.00%	0
	Tracy Unit 3	4,265,590	0.75%	31,923	0.75%	31,923	0.00%	0
	Tracy Common	486,005	3.33%	16,195	3.33%	16,195	0.00%	0
	Valmy Unit 1	14,300,204	1.27%	181,145	1.27%	181,145	0.00%	0
	Valmy Unit 2	14,173,412	3.23%	457,496	3.23%	457,496	0.00%	0
	Total Accessory Electric Equipment	37,756,240	2.11%	798,013	2.11%	798,013	0.00%	0
316.00	Miscellaneous Power Plant Equipment							
	FT Churchill Unit 1	921,307	8.90%	81,958	8.90%	81,958	0.00%	0
	FT Churchill Unit 2	197,897	2.87%	5,680	2.87%	5,680	0.00%	0
	FT Churchill Common	2,081,169	2.91%	60,666	2.91%	60,666	0.00%	0
	Tracy Unit 3	645,935	1.28%	8,242	1.28%	8,242	0.00%	0
	Tracy Common	914,768	4.29%	39,208	4.29%	39,208	0.00%	0
	Valmy Unit 1	3,071,621	1.77%	54,514	1.77%	54,514	0.00%	0
	Valmy Unit 2	3,510,443	7.65%	268,409	7.65%	268,409	0.00%	0
	Total Miscellaneous Power Plant Equipment	11,343,141	4.57%	518,677	4.57%	518,677	0.00%	0
	Total Steam Production Plant	517,387,414	4.87%	25,175,381	4.87%	25,175,381	0.00%	0
	Other Production Plant							
341.00	Structures and Improvements							
	Clark Mountain CT No. 3	2,400,198	3.68%	88,434	3.67%	88,014	-0.02%	-420
	Clark Mountain CT No. 4	2,370,014	3.78%	89,628	3.76%	89,201	-0.02%	-427
	Brunswick	23,728	11.66%	2,767	11.67%	2,768	0.00%	1

Detailed Rate Comparison

(as of study date)

		[1]	[2]		[3]		[4]	
			SPPC Proposed Rates		NNUC Proposed Rates		Difference	
Account No.	Description	Original Cost	Rate	Annual Accrual	Rate	Annual Accrual	Rate	Annual Accrual
	Tracy Units 4 & 5	7,821,487	6.57%	513,525	6.57%	513,582	0.00%	57
	Tracy Units 8, 9, & 10	54,102,629	3.45%	1,866,404	2.62%	1,416,791	-0.83%	-449,613
	Total Structures and Improvements	66,718,056	3.84%	2,560,758	3.16%	2,110,356	-0.68%	-450,402
342.00	Fuel Holders, Producers and Accessories							
	Clark Mountain CT No. 3	5,063,651	3.32%	168,048	3.32%	167,950	0.00%	-98
	Clark Mountain CT No. 4	5,022,992	3.42%	171,821	3.42%	171,712	0.00%	-109
	Brunswick	7,708	5.58%	430	5.58%	430	0.00%	0
	Tracy Units 4 & 5	1,183,473	1.71%	20,197	1.71%	20,250	0.00%	53
	Tracy Units 8, 9, & 10	96,005,883	3.14%	3,013,070	2.41%	2,313,185	-0.73%	-699,885
	Total Fuel Holders, Producers and Accessories	107,283,708	3.14%	3,373,566	2.49%	2,673,526	-0.65%	-700,040
343.00	Prime Movers							
	Clark Mountain CT No. 3	9,620,647	4.05%	389,245	4.04%	388,811	0.00%	-434
	Clark Mountain CT No. 4	10,418,456	4.19%	436,958	4.19%	436,555	0.00%	-403
	Tracy Units 4 & 5	152,110	0.70%	1,058	0.70%	1,061	0.00%	3
	Total Prime Movers	20,191,214	4.10%	827,261	4.09%	826,427	0.00%	-834
344.00	Generators							
	Clark Mountain CT No. 3	9,987,582	5.34%	533,320	5.32%	531,118	-0.02%	-2,202
	Clark Mountain CT No. 4	5,631,145	4.22%	237,767	4.23%	238,094	0.01%	327
	Brunswick	606,804	9.43%	57,221	9.43%	57,221	0.00%	0
	Tracy Units 4 & 5	39,331,448	4.42%	1,737,535	4.42%	1,737,533	0.00%	-2
	Tracy Units 8, 9, & 10	252,272,407	3.76%	9,480,993	3.04%	7,673,523	-0.72%	-1,807,470
	Total Generators	307,829,386	3.91%	12,046,836	3.33%	10,237,488	-0.59%	-1,809,348
345.00	Accessory Electric Equipment							
	Clark Mountain CT No. 3	4,325,546	7.60%	328,809	7.64%	330,313	0.03%	1,504
	Clark Mountain CT No. 4	3,443,309	6.19%	213,185	6.22%	214,213	0.03%	1,028
	Brunswick	151,292	7.33%	11,088	7.33%	11,088	0.00%	0
	Tracy Units 4 & 5	28,862,919	2.34%	676,281	2.34%	674,468	-0.01%	-1,813
	Tracy Units 8, 9, & 10	29,518,078	3.09%	911,276	2.40%	707,617	-0.69%	-203,659
	Total Accessory Electric Equipment	66,301,144	3.23%	2,140,639	2.92%	1,937,698	-0.31%	-202,941
346.00	Miscellaneous Power Plant Equipment							
	Clark Mountain CT No. 3	317,087	5.28%	16,753	5.30%	16,800	0.01%	47
	Clark Mountain CT No. 4	336,555	4.60%	15,486	4.62%	15,535	0.01%	49
	Tracy Units 4 & 5	2,215,753	7.43%	164,716	7.43%	164,555	-0.01%	-161
	Tracy Units 8, 9, & 10	30,269,883	3.52%	1,064,524	2.86%	864,891	-0.66%	-199,633
	Solar	1,427,657	4.85%	69,177	4.85%	69,176	0.00%	-1
	Wind	107,617	4.82%	5,183	4.82%	5,183	0.00%	0
	Total Miscellaneous Power Plant Equipment	34,674,552	3.85%	1,335,839	3.28%	1,136,141	-0.58%	-199,698
	Total Other Production Plant	602,998,060	3.70%	22,284,899	3.14%	18,921,636	-0.56%	-3,363,263
	Transmission Plant							
350.20	Land Rights	48,510,113	1.40%	680,675	1.01%	489,382	-0.39%	-191,293
352.00	Structures and Improvements	19,950,901	1.99%	396,036	1.54%	306,914	-0.45%	-89,122
353.00	Station Equipment	262,191,380	1.94%	5,085,164	1.84%	4,815,756	-0.10%	-269,408
354.00	Towers and Fixtures	124,144,549	1.32%	1,640,730	1.36%	1,690,712	0.04%	49,982
355.00	Poles and Fixtures	82,730,020	2.37%	1,959,333	1.69%	1,397,684	-0.68%	-561,649
356.00	Overhead Conductors and Devices	156,113,047	2.37%	3,695,513	1.84%	2,875,380	-0.53%	-820,133
357.00	Underground Conduit	8,505,021	1.69%	143,870	1.69%	143,834	0.00%	-36
358.00	Underground Conductors and Devices	12,522,247	1.90%	238,415	1.91%	239,149	0.01%	734
359.00	Roads and Trails	446,725	1.18%	5,287	0.73%	3,243	-0.46%	-2,044
	Total Transmission Plant	715,114,003	1.94%	13,845,023	1.67%	11,962,054	-0.26%	-1,882,969
	Distribution Plant							
360.20	Land Rights	8,823,971	1.49%	131,521	0.88%	77,661	-0.61%	-53,860
361.00	Structures and Improvements	3,770,549	1.94%	73,049	1.07%	40,194	-0.87%	-32,855
362.00	Station Equipment	192,267,281	1.51%	2,897,248	1.32%	2,530,442	-0.19%	-366,806
364.00	Poles, Towers and Fixtures	167,096,687	2.79%	4,655,197	2.10%	3,502,056	-0.69%	-1,153,141
365.00	Overhead Conductors and Devices	132,743,789	2.70%	3,590,321	2.49%	3,310,626	-0.21%	-279,695
366.00	Underground Conduit	79,439,495	1.43%	1,133,064	1.25%	990,942	-0.18%	-142,122
367.00	Underground Conductors and Devices	322,144,678	2.24%	7,215,124	1.68%	5,425,312	-0.56%	-1,789,812
368.00	Transformers	215,167,094	2.41%	5,175,855	1.85%	3,983,303	-0.55%	-1,192,552
369.00	Services	131,870,398	1.75%	2,306,655	1.29%	1,706,399	-0.46%	-600,256
370.10	Meters - AMI	36,015,329	5.10%	1,837,316	5.10%	1,836,782	0.00%	-534
371.00	Installations on Customer Premises	7,466,849	1.75%	130,581	1.75%	130,670	0.00%	89
373.00	Street Lighting and Signal Systems	38,909,924	2.78%	1,081,313	2.78%	1,079,897	0.00%	-1,416

Detailed Rate Comparison
(as of study date)

		[1]	[2]		[3]		[4]	
			SPPC Proposed Rates		NNUC Proposed Rates		Difference	
Account No.	Description	Original Cost	Rate	Annual Accrual	Rate	Annual Accrual	Rate	Annual Accrual
	Total Distribution Plant	1,335,716,044	2.26%	30,227,244	1.84%	24,614,284	-0.42%	-5,612,960
	General Plant							
389.20	Land Rights	128,567	1.50%	1,931	1.50%	1,930	0.00%	0
390.00	Structures and Improvements	12,215,888	1.52%	186,000	1.45%	176,656	-0.08%	-9,344
391.10	Office Furniture and Equipment	1,693,967	5.00%	84,698	5.00%	84,698	0.00%	0
391.20	Computer Equipment	4,467,605	20.00%	893,521	20.00%	893,521	0.00%	0
392.00	Transportation Equipment	7,113,899	5.55%	394,923	5.55%	394,821	0.00%	0
393.00	Stores Equipment	6,826	5.00%	341	5.00%	341	0.00%	0
394.00	Tools, Shop and Garage Equipment	3,909,154	4.00%	156,366	4.00%	156,366	0.00%	0
395.00	Laboratory Equipment	785,201	6.67%	52,373	6.67%	52,373	0.00%	0
396.00	Power Operated Equipment	2,784,743	4.27%	118,918	4.27%	118,810	0.00%	0
397.00	Communication Equipment	68,768,905	6.67%	4,586,886	6.67%	4,586,886	0.00%	0
398.00	Miscellaneous Equipment	52,782	20.00%	10,556	20.00%	10,556	0.00%	0
	Total General Plant	101,927,538	6.36%	6,486,513	7.71%	6,476,959	1.34%	-9,344
	Common Plant							
303.00	Software	147,861,102	5.74%	8,486,177	3.17%	4,681,358	-2.57%	-3,804,819
389.20	Land Rights	279,553	0.78%	2,191	0.78%	2,192	0.00%	0
390.00	Structures and Improvements	56,958,653	1.90%	1,084,767	1.52%	863,103	-0.39%	-221,664
391.10	Office Furniture and Equipment	10,593,485	5.00%	529,674	5.00%	529,674	0.00%	0
391.20	Computer Equipment	16,773,139	20.00%	3,354,628	20.00%	3,354,628	0.00%	0
392.00	Transportation Equipment	1,689,261	3.81%	64,284	3.81%	64,361	0.00%	0
394.00	Tools, Shop and Garage Equipment	486,376	4.00%	19,455	4.00%	19,455	0.00%	0
396.00	Power Operated Equipment	95,411	3.95%	3,767	3.95%	3,769	0.00%	0
397.00	Communication Equipment	19,022,766	6.67%	1,268,818	6.67%	1,268,818	0.00%	0
398.00	Miscellaneous Equipment	11,870	6.67%	792	6.67%	792	0.00%	0
	Total Common Plant	253,771,614	5.84%	14,814,553	4.50%	10,788,150	-1.33%	-4,026,483
	TOTAL DEPRECIABLE PLANT	**3,554,368,019**	**3.20%**	**113,773,949**	**2.82%**	**98,455,713**	**-0.38%**	**-15,318,106**
	Accounts Not Studied							
301.00	Organization	26,156						
302.00	Franchises and Consents	130						
310.10	Land	1,016,248						
317.00	Asset Retirement Costs	351,809						
340.10	Land	17,319						
347.00	Asset Retirement Costs	171,851						
350.10	Land	1,250,443						
360.10	Land	4,704,507						
370.00	Meters	4,402,487						
374.00	Asset Retirement Costs	1,094,399						
389.10	Land	1,530,800						
389.10	Land Common	9,369,110						
391.30	ESCC Computers	197,598						
399.00	Asset Retirement Costs	111,025						
	Total Accounts Not Studied	24,243,884						
	Total Electric Plant	$ 3,578,611,903						

[1] Original cost of plant at 12-31-15 from the Depreciation Study
[2] Proposed depreciation rates and annual accruals from the Depreciation Study
[3] Proposed rates and accruals from DJG 5
[4] = [3] - [2]

Depreciation Rate Development
(SL-AL-RL-BG System)

		[1]	[2]		[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
Account No.	Description	Original Cost	Iowa Curve Type	AL	Net Salvage	Depreciable Base	Book Reserve	Future Accruals	Remaining Life	Service Life Accrual	Service Life Rate	Net Salvage Accrual	Net Salvage Rate	Total Accrual	Total Rate
	Intangible Plant														
303.00	Software	27,453,346	SQ	15	0.0%	27,453,346	21,108,645	6,344,701	12.3	517,250	1.9%	0	0.0%	517,250	**1.88%**
	Total Intangible Plant	27,453,346				27,453,346	21,108,645	6,344,701	12.3	517,250	1.9%	0	0.0%	517,250	**1.88%**
	Steam Production Plant														
310.20	Land Rights														
	FT Churchill Common	46,092	SQ	13	0%	46,092	16,642	29,450	13.0	2,265	4.9%	0	0.0%	2,265	**4.91%**
	Valmy Unit 1	10,000	SQ	1	0%	10,000	10,000	0	1.0	0	0.0%	0	0.0%	0	**0.00%**
	Valmy Unit 2	307,211	SQ	10	0%	307,211	96,862	210,349	10.0	21,035	6.8%	0	0.0%	21,035	**6.85%**
	Tracy Common	203,037	SQ	28	0%	203,037	134,593	68,444	38.0	1,801	0.9%	0	0.0%	1,801	**0.89%**
	Total Land Rights	566,340				566,340	258,098	308,243	12.3	25,101	4.4%	0	0.0%	25,101	**4.43%**
311.00	Structures and Improvements														
	FT Churchill Unit 1	2,914,707	S1	90	-19%	3,468,501	2,866,290	602,211	9.7	4,991	0.2%	57,092	2.0%	62,084	**2.13%**
	FT Churchill Unit 2	2,448,286	S1	90	-18%	2,888,977	2,567,952	321,025	12.8	-9,349	-0.4%	34,429	1.4%	25,080	**1.02%**
	FT Churchill Common	3,973,293	S1	90	0%	3,973,293	2,588,325	1,384,969	12.9	107,362	2.7%	0	0.0%	107,362	**2.70%**
	Tracy Unit 3	2,321,999	S1	90	-11%	2,577,419	2,263,857	313,562	12.6	4,614	0.2%	20,271	0.9%	24,886	**1.07%**
	Tracy Common	4,455,013	S1	90	-1%	4,499,563	2,843,762	1,655,801	12.9	124,903	2.8%	3,453	0.1%	128,357	**2.88%**
	Valmy Unit 1	24,441,824	S1	90	-6%	25,908,333	18,867,069	7,041,264	9.9	563,107	2.3%	148,132	0.6%	711,239	**2.91%**
	Valmy Unit 2	43,314,701	S1	90	-4%	45,047,289	22,623,901	22,423,388	9.9	2,089,980	4.8%	175,009	0.4%	2,264,989	**5.23%**
	Total Structures and Improvements	83,869,823				88,363,376	54,621,157	33,742,219	10.2	2,885,608	3.4%	438,387	0.5%	3,323,996	**3.96%**
312.00	Boiler Plant Equipment														
	FT Churchill Unit 1	20,707,402	S0	55	-18%	24,434,735	11,169,574	13,265,161	9.9	963,417	4.7%	376,498	1.8%	1,339,915	**6.47%**
	FT Churchill Unit 2	18,760,977	S0	55	-17%	21,950,343	8,140,801	13,809,542	12.6	842,871	4.5%	253,124	1.3%	1,095,995	**5.84%**
	FT Churchill Common	2,599,302	S0	55	-1%	2,625,295	797,170	1,828,125	12.4	145,333	5.6%	2,096	0.1%	147,429	**5.67%**
	Tracy Unit 3	31,305,325	S0	55	-10%	34,435,858	16,449,602	17,986,256	12.5	1,188,458	3.8%	250,443	0.8%	1,438,900	**4.60%**
	Tracy Common	2,635,818	S0	55	-1%	2,662,176	790,051	1,872,125	12.3	150,062	5.7%	2,143	0.1%	152,205	**5.77%**
	Valmy Unit 1	81,162,832	S0	55	-6%	86,032,602	48,484,084	37,548,518	9.7	3,368,943	4.2%	502,038	0.6%	3,870,981	**4.77%**
	Valmy Unit 2	137,572,126	S0	55	-4%	143,075,011	63,808,231	79,266,780	9.7	7,604,525	5.5%	567,308	0.4%	8,171,833	**5.94%**
	Total Boiler Plant Equipment	294,743,783				315,216,020	149,639,514	165,576,506	10.2	14,263,610	4.8%	1,953,650	0.7%	16,217,260	**5.50%**
314.00	Turbogenerator Units														
	FT Churchill Unit 1	8,048,178	L1	65	-18%	9,496,850	7,014,648	2,482,203	9.8	105,462	1.3%	147,824	1.8%	253,286	**3.15%**
	FT Churchill Unit 2	12,812,584	L1	65	-17%	14,990,724	9,915,453	5,075,271	12.5	231,771	1.8%	174,251	1.4%	406,022	**3.17%**
	FT Churchill Common	147,858	L1	65	-1%	149,336	82,242	67,094	12.7	5,167	3.5%	116	0.1%	5,283	**3.57%**
	Tracy Unit 3	10,771,303	L1	65	-10%	11,848,434	9,997,180	1,851,254	12.2	63,453	0.6%	88,289	0.8%	151,742	**1.41%**
	Tracy Common	371,594	L1	65	-1%	375,310	316,263	59,047	12.3	4,498	1.2%	302	0.1%	4,801	**1.29%**
	Valmy Unit 1	24,638,579	L1	65	-6%	26,116,894	14,468,804	11,648,090	9.7	1,048,430	4.3%	152,404	0.6%	1,200,834	**4.87%**
	Valmy Unit 2	32,317,990	L1	65	-4%	33,610,710	12,126,509	21,484,201	9.7	2,081,596	6.4%	133,270	0.4%	2,214,866	**6.85%**
	Total Turbogenerator Units	89,108,087				96,588,258	53,921,099	42,667,159	10.1	3,540,377	4.0%	696,456	0.8%	4,236,833	**4.75%**
315.00	Accessory Electric Equipment														
	FT Churchill Unit 1	1,633,199	S1	60	-16%	1,894,511	1,523,188	371,323	9.3	11,829	0.7%	28,098	1.7%	39,927	**2.44%**
	FT Churchill Unit 2	1,514,744	S1	60	-15%	1,741,955	1,702,325	39,630	12.9	-14,541	-1.0%	17,613	1.2%	3,072	**0.20%**
	FT Churchill Common	1,383,087	S1	60	0%	1,383,087	508,464	874,623	12.8	68,330	4.9%	0	0.0%	68,330	**4.94%**
	Tracy Unit 3	4,265,590	S1	60	-9%	4,649,493	4,271,419	378,074	11.8	-494	0.0%	32,534	0.8%	32,040	**0.75%**
	Tracy Common	486,005	S1	60	0%	486,005	282,777	203,228	12.5	16,258	3.3%	0	0.0%	16,258	**3.35%**
	Valmy Unit 1	14,300,204	S1	60	-6%	15,158,217	13,446,679	1,711,538	9.4	90,801	0.6%	91,278	0.6%	182,078	**1.27%**
	Valmy Unit 2	14,173,412	S1	60	-4%	14,740,348	10,328,040	4,412,308	9.6	400,560	2.8%	59,056	0.4%	459,615	**3.24%**

Depreciation Rate Development
(SL-AL-RL-BG System)

Account No.	Description	[1] Original Cost	[2] Iowa Curve Type	[2] Iowa Curve AL	[3] Net Salvage	[4] Depreciable Base	[5] Book Reserve	[6] Future Accruals	[7] Remaining Life	[8] Service Life Accrual	[9] Service Life Rate	[10] Net Salvage Accrual	[11] Net Salvage Rate	[12] Total Accrual	[13] Total Rate
	Total Accessory Electric Equipment	37,756,240				40,053,616	32,062,892	7,990,723	10.0	572,742	1.5%	228,579	0.6%	801,321	**2.12%**
316.00	Miscellaneous Power Plant Equipment														
	FT Churchill Unit 1	921,307	R1.5	50	-17%	1,077,929	287,955	789,974	9.6	65,974	7.2%	16,315	1.8%	82,289	**8.93%**
	FT Churchill Unit 2	197,897	R1.5	50	-16%	229,560	159,261	70,299	12.4	3,116	1.6%	2,554	1.3%	5,669	**2.86%**
	FT Churchill Common	2,081,169	R1.5	50	0%	2,081,169	1,325,809	755,360	12.5	60,429	2.9%	0	0.0%	60,429	**2.90%**
	Tracy Unit 3	645,935	R1.5	50	-9%	704,069	606,848	97,221	11.8	3,312	0.5%	4,927	0.8%	8,239	**1.28%**
	Tracy Common	914,768	R1.5	50	0%	914,768	428,682	486,086	12.4	39,200	4.3%	0	0.0%	39,200	**4.29%**
	Valmy Unit 1	3,071,621	R1.5	50	-6%	3,255,919	2,737,599	518,319	9.5	35,160	1.1%	19,400	0.6%	54,560	**1.78%**
	Valmy Unit 2	3,510,443	R1.5	50	-4%	3,650,861	1,046,392	2,604,469	9.7	254,026	7.2%	14,476	0.4%	268,502	**7.65%**
	Total Miscellaneous Power Plant Equipment	11,343,141				11,914,276	6,592,546	5,321,730	10.3	461,218	4.1%	57,671	0.5%	518,889	**4.57%**
	Total Steam Production Plant	517,387,414				552,701,885	297,095,305	255,606,580	10.2	21,748,657	4.2%	3,374,744	0.7%	25,123,400	**4.86%**
	Other Production Plant														
341.00	Structures and Improvements														
	Clark Mountain CT No. 3	2,400,198	R1.5	90	-6%	2,544,210	1,760,886	783,324	8.9	71,833	3.0%	16,181	0.7%	**88,014**	**3.67%**
	Clark Mountain CT No. 4	2,370,014	R1.5	90	-7%	2,535,915	1,742,023	793,892	8.9	70,561	3.0%	18,641	0.8%	**89,201**	**3.76%**
	Brunswick	23,728	R1.5	90	-65%	39,152	28,079	11,072	4.0	-1,088	-4.6%	3,856	16.3%	**2,768**	**11.67%**
	Tracy Units 4 & 5	7,821,487	R1.5	90	-3%	8,056,132	(7,103)	8,063,235	15.7	498,636	6.4%	14,946	0.2%	**513,582**	**6.57%**
	Tracy Units 8, 9, & 10	54,102,629	R1.5	90	-3%	55,725,708	5,387,134	50,338,574	35.5	1,371,109	2.5%	45,682	0.1%	**1,416,791**	**2.62%**
	Total Structures and Improvements	66,718,056				68,901,116	8,911,019	59,990,097	28.4	2,011,051	3.0%	99,305	0.1%	2,110,356	**3.16%**
342.00	Fuel Holders, Producers and Accessories														
	Clark Mountain CT No. 3	5,063,651	R1.5	70	-6%	5,367,470	3,889,513	1,477,957	8.8	133,425	2.6%	34,525	0.7%	167,950	**3.32%**
	Clark Mountain CT No. 4	5,022,992	R1.5	70	-7%	5,374,602	3,863,540	1,511,062	8.8	131,756	2.6%	39,956	0.8%	171,712	**3.42%**
	Brunswick	7,708	R1.5	70	-65%	12,718	10,999	1,719	4.0	-823	-10.7%	1,253	16.3%	430	**5.58%**
	Tracy Units 4 & 5	1,183,473	R1.5	70	-3%	1,218,977	907,124	311,853	15.4	17,945	1.5%	2,305	0.2%	20,250	**1.71%**
	Tracy Units 8, 9, & 10	96,005,883	R1.5	70	-3%	98,886,059	19,219,968	79,666,091	34.4	2,229,556	2.3%	83,629	0.1%	2,313,185	**2.41%**
	Total Fuel Holders, Producers and Accessories	107,283,708				110,859,827	27,891,145	82,968,682	31.0	2,511,859	2.3%	161,667	0.2%	2,673,526	**2.49%**
343.00	Prime Movers														
	Clark Mountain CT No. 3	9,620,647	S0.5	50	-6%	10,197,886	6,892,990	3,304,896	8.5	320,901	3.3%	67,910	0.7%	388,811	**4.04%**
	Clark Mountain CT No. 4	10,418,456	S0.5	50	-7%	11,147,748	7,437,033	3,710,715	8.5	350,756	3.4%	85,799	0.8%	436,555	**4.19%**
	Tracy Units 4 & 5	152,110	S0.5	50	-3%	156,674	141,292	15,382	14.5	746	0.5%	315	0.2%	1,061	**0.70%**
	Total Prime Movers	20,191,214				21,502,308	14,471,315	7,030,993	8.5	672,403	3.3%	154,024	0.8%	**826,427**	**4.09%**
344.00	Generators														
	Clark Mountain CT No. 3	9,987,582	S0	45	-6%	10,586,837	6,072,336	4,514,501	8.5	460,617	4.6%	70,501	0.7%	**531,118**	**5.32%**
	Clark Mountain CT No. 4	5,631,145	S0	45	-6%	5,969,013	3,969,027	1,999,986	8.4	197,871	3.5%	40,222	0.7%	**238,094**	**4.23%**
	Brunswick	606,804	S0	45	-65%	1,001,226	772,342	228,884	4.0	-41,385	-6.8%	98,606	16.3%	**57,221**	**9.43%**
	Tracy Units 4 & 5	39,331,448	S0	45	-3%	40,511,392	14,969,655	25,541,737	14.7	1,657,265	4.2%	80,268	0.2%	**1,737,533**	**4.42%**
	Tracy Units 8, 9, & 10	252,272,407	S0	45	-2%	257,317,855	30,641,995	226,675,860	29.5	7,502,722	3.0%	170,801	0.1%	**7,673,523**	**3.04%**
	Total Generators	307,829,386				315,386,323	56,425,355	258,960,968	25.3	9,777,091	3.2%	460,397	0.1%	10,237,488	**3.33%**
345.00	Accessory Electric Equipment														
	Clark Mountain CT No. 3	4,325,546	S1.5	60	-6%	4,585,079	1,678,326	2,906,753	8.8	300,821	7.0%	29,492	0.7%	330,313	**7.64%**
	Clark Mountain CT No. 4	3,443,309	S1.5	60	-7%	3,684,340	1,820,689	1,863,651	8.7	186,508	5.4%	27,705	0.8%	214,213	**6.22%**
	Brunswick	151,292	S1.5	60	-65%	249,632	205,280	44,352	4.0	-13,497	-8.9%	24,585	16.3%	11,088	**7.33%**

Depreciation Rate Development
(SL-AL-RL-BG System)

Account No.	Description	[1] Original Cost	[2] Iowa Curve Type	AL	[3] Net Salvage	[4] Depreciable Base	[5] Book Reserve	[6] Future Accruals	[7] Remaining Life	[8] Service Life Accrual	[9] Service Life Rate	[10] Net Salvage Accrual	[11] Net Salvage Rate	[12] Total Accrual	[13] Total Rate
	Tracy Units 4 & 5	28,862,919	S1.5	60	-3%	29,728,807	19,409,448	10,319,359	15.3	617,874	2.1%	56,594	0.2%	674,468	**2.34%**
	Tracy Units 8, 9, & 10	29,518,078	S1.5	60	-3%	30,403,620	5,948,394	24,455,226	34.6	681,993	2.3%	25,623	0.1%	707,617	**2.40%**
	Total Accessory Electric Equipment	66,301,144				68,651,478	29,062,137	39,589,342	20.4	1,773,699	2.7%	163,999	0.2%	1,937,698	**2.92%**
346.00	Miscellaneous Power Plant Equipment														
	Clark Mountain CT No. 3	317,087	O1	40	-5%	332,942	193,505	139,437	8.3	14,889	4.7%	1,910	0.6%	16,800	**5.30%**
	Clark Mountain CT No. 4	336,555	O1	40	-6%	356,748	227,807	128,941	8.3	13,102	3.9%	2,433	0.7%	15,535	**4.62%**
	Tracy Units 4 & 5	2,215,753	O1	40	-3%	2,282,225	(54,457)	2,336,682	14.2	159,874	7.2%	4,681	0.2%	164,555	**7.43%**
	Tracy Units 8, 9, & 10	30,269,883	O1	40	-2%	30,875,281	6,822,653	24,052,628	27.8	843,122	2.8%	21,769	0.1%	864,891	**2.86%**
	Solar	1,427,657	O1	40	0%	1,427,657	286,245	1,141,412	16.5	69,176	4.8%	0	0.0%	69,176	**4.85%**
	Wind	107,617	O1	40	0%	107,617	22,091	85,526	16.5	5,183	4.8%	0	0.0%	5,183	**4.82%**
	Total Miscellaneous Power Plant Equipment	34,674,552				35,382,470	7,497,844	27,884,626	24.5	1,105,348	3.2%	30,793	0.1%	1,136,141	**3.28%**
	Total Other Production Plant	602,998,060				620,683,523	144,258,814	476,424,709	25.2	17,851,449	3.0%	1,070,187	0.2%	18,921,636	**3.14%**
	Transmission Plant														
350.20	Land Rights	48,510,113	R5	92	0.0%	48,510,113	10,778,793	37,731,320	77.1	489,382	1.0%	0	0.0%	489,382	**1.01%**
352.00	Structures and Improvements	19,950,901	R3	66	-5.0%	20,948,446	5,019,618	15,928,827	51.9	287,693	1.4%	19,221	0.1%	306,914	**1.54%**
353.00	Station Equipment	262,191,380	R2.5	55	-5.0%	275,300,949	73,039,201	202,261,747	42.0	4,503,623	1.7%	312,133	0.1%	4,815,756	**1.84%**
354.00	Towers and Fixtures	124,144,549	R4	70	-5.0%	130,351,777	44,463,599	85,888,178	50.8	1,568,523	1.3%	122,190	0.1%	1,690,712	**1.36%**
355.00	Poles and Fixtures	82,730,020	R2	77	-40.0%	115,822,029	30,842,856	84,979,172	60.8	853,407	1.0%	544,276	0.7%	1,397,684	**1.69%**
356.00	Overhead Conductors and Devices	156,113,047	R4	67	-30.0%	202,946,962	65,503,807	137,443,155	47.8	1,895,591	1.2%	979,789	0.6%	2,875,380	**1.84%**
357.00	Underground Conduit	8,505,021	S4	60	0.0%	8,505,021	2,435,224	6,069,797	42.2	143,834	1.7%	0	0.0%	143,834	**1.69%**
358.00	Underground Conductors and Devices	12,522,247	S3	50	0.0%	12,522,247	4,032,447	8,489,800	35.5	239,149	1.9%	0	0.0%	239,149	**1.91%**
359.00	Roads and Trails	446,725	R5	95	0.0%	446,725	270,611	176,114	54.3	3,243	0.7%	0	0.0%	3,243	**0.73%**
	Total Transmission Plant	715,114,003				815,354,267	236,386,156	578,968,111	48.4	9,984,446	1.4%	1,977,608	0.3%	11,962,054	**1.67%**
	Distribution Plant														
360.20	Land Rights	8,823,971	R5	95	0.0%	8,823,971	2,735,373	6,088,598	78.4	77,661	0.9%	0	0.0%	77,661	**0.88%**
361.00	Structures and Improvements	3,770,549	R2	89	-5.0%	3,959,076	844,063	3,115,013	77.5	37,761	1.0%	2,433	0.1%	40,194	**1.07%**
362.00	Station Equipment	192,267,281	R2.5	73	-10.0%	211,494,009	67,511,876	143,982,133	56.9	2,192,538	1.1%	337,904	0.2%	2,530,442	**1.32%**
364.00	Poles, Towers and Fixtures	167,096,687	R1	68	-50.0%	250,645,031	60,833,600	189,811,431	54.2	1,960,574	1.2%	1,541,482	0.9%	3,502,056	**2.10%**
365.00	Overhead Conductors and Devices	132,743,789	R3	55	-50.0%	199,115,683	81,919,506	117,196,177	35.4	1,435,714	1.1%	1,874,912	1.4%	3,310,626	**2.49%**
366.00	Underground Conduit	79,439,495	R4	78	-10.0%	87,383,444	31,890,671	55,492,773	56.0	849,086	1.1%	141,856	0.2%	990,942	**1.25%**
367.00	Underground Conductors and Devices	322,144,678	S1	75	-40.0%	451,002,550	122,228,625	328,773,925	60.6	3,298,945	1.0%	2,126,368	0.7%	5,425,312	**1.68%**
368.00	Transformers	215,167,094	R0.5	55	-10.0%	236,683,804	55,045,188	181,638,616	45.6	3,511,445	1.6%	471,858	0.2%	3,983,303	**1.85%**
369.00	Services	131,870,398	R1	82	-25.0%	164,837,998	44,707,529	120,130,469	70.4	1,238,109	0.9%	468,290	0.4%	1,706,399	**1.29%**
370.10	Meters - AMI	36,015,329	L0.5	14	0.0%	36,015,329	5,080,612	30,934,718	16.8	1,841,352	5.1%	0	0.0%	1,841,352	**5.10%**
371.00	Installations on Customer Premises	7,466,849	R2	35	-20.0%	8,960,219	7,262,145	1,698,074	18.7	10,947	0.1%	79,859	1.6%	90,806	**1.75%**
373.00	Street Lighting and Signal Systems	38,909,924	R2	50	-40.0%	54,473,893	14,625,693	39,848,201	36.9	658,109	1.7%	421,788	1.1%	1,079,897	**2.78%**
	Total Distribution Plant	1,335,716,044				1,713,395,006	494,684,880	1,218,710,126	49.6	17,112,241	1.3%	7,466,749	0.6%	24,578,990	**1.84%**
	General Plant														
389.20	Land Rights	128,567	R4	65	0.0%	128,567	44,042	84,525	43.8	1,930	1.5%	0	0.0%	1,930	**1.50%**
390.00	Structures and Improvements	12,215,888	R2	72	-5.0%	12,826,682	2,969,291	9,857,392	55.8	165,710	1.4%	10,946	0.1%	176,656	**1.45%**
391.10	Office Furniture and Equipment	1,693,967	SQ	20	0.0%	1,693,967	965,677	728,290	11.3	64,450	3.8%	0	1.2%	64,450	**5.00%**
391.20	Computer Equipment	4,467,605	SQ	5	0.0%	4,467,605	167,102	4,300,502	3.8	1,131,711	25.3%	0	-5.3%	1,131,711	**20.00%**
392.00	Transportation Equipment	7,113,899	L1	14	10.0%	6,402,509	2,557,937	3,844,572	9.7	469,687	6.6%	-73,339	-1.1%	396,348	**5.55%**

Depreciation Rate Development
(SL-AL-RL-BG System)

		[1]	[2]		[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
			Iowa Curve							Service Life		Net Salvage		Total	
Account No.	Description	Original Cost	Type	AL	Net Salvage	Depreciable Base	Book Reserve	Future Accruals	Remaining Life	Accrual	Rate	Accrual	Rate	Accrual	Rate
393.00	Stores Equipment	6,826	SQ	20	0.0%	6,826	(27,056)	33,882	11.5	2,946	43.2%	0	-38.2%	2,946	5.00%
394.00	Tools, Shop and Garage Equipment	3,909,154	SQ	25	0.0%	3,909,154	327,309	3,581,845	8.0	447,731	11.5%	0	-7.5%	447,731	4.00%
395.00	Laboratory Equipment	785,201	SQ	15	0.0%	785,201	294,666	490,535	4.8	102,195	13.0%	0	-6.3%	102,195	6.67%
396.00	Power Operated Equipment	2,784,743	L1	14	10.0%	2,506,269	1,448,856	1,057,412	8.9	150,100	5.4%	-31,289	-1.1%	118,810	4.27%
397.00	Communication Equipment	68,768,905	SQ	15	0.0%	68,768,905	21,825,851	46,943,054	8.7	5,395,753	7.8%	0	-1.2%	5,395,753	6.67%
398.00	Miscellaneous Equipment	52,782	SQ	50	0.0%	52,782	24,634	28,148	1.5	18,766	35.6%	0	-15.6%	18,766	20.00%
	Total General Plant	101,927,538				101,548,468	30,598,310	70,950,158	9.0	7,950,978	7.8%	-93,682	-0.1%	7,857,296	7.71%
	Common Plant														
303.00	Software	147,861,102	SQ	15	0.0%	147,861,102	92,343,627	55,517,475	11.9	4,681,358	3.2%	0	0.0%	4,681,358	3.17%
389.20	Land Rights	279,553	R4	65	0.0%	279,553	151,340	128,213	58.5	2,192	0.8%	0	0.0%	2,192	0.78%
390.00	Structures and Improvements	56,958,653	R2	72	-5.0%	59,806,585	11,645,436	48,161,149	55.8	812,065	1.4%	51,038	0.1%	863,103	1.52%
391.10	Office Furniture and Equipment	10,593,485	SQ	20	0.0%	10,593,485	5,822,141	4,771,344	12.3	387,914	3.7%	0	1.3%	387,914	5.00%
391.20	Computer Equipment	16,773,139	SQ	5	0.0%	16,773,139	5,973,114	10,800,025	2.7	4,000,009	23.8%	0	-3.8%	4,000,009	20.00%
392.00	Transportation Equipment	1,689,261	L1	14	10.0%	1,520,335	759,862	760,473	11.8	78,763	4.7%	-14,316	-0.9%	64,447	3.81%
394.00	Tools, Shop and Garage Equipment	486,376	SQ	25	0.0%	486,376	486,376	0	0.0						4.00%
396.00	Power Operated Equipment	95,411	L1	14	10.0%	85,870	52,690	33,180	8.8	4,855	5.1%	-1,084	-1.1%	3,770	3.95%
397.00	Communication Equipment	19,022,766	SQ	15	0.0%	19,022,766	5,918,098	13,104,668	9.2	1,424,420	7.5%	0	-0.8%	1,424,420	6.67%
398.00	Miscellaneous Equipment	11,870	SQ	15	0.0%	11,870	(2,213)	14,083	11.5	1,225	10.3%	0	-3.6%	1,225	6.67%
	Total Common Plant	253,771,614				256,441,080	123,150,471	133,290,609	11.7	11,392,800	4.5%	35,638	0.0%	11,428,439	4.50%
	TOTAL DEPRECIABLE PLANT	**3,554,368,019**				**4,087,577,575**	**1,347,282,581**	**2,740,294,994**	**27.3**	**86,557,821**	**2.4%**	**13,831,244**	**0.4%**	**100,389,065**	**2.82%**
	Accounts Not Studied														
301.00	Organization	26,156													
302.00	Franchises and Consents	130													
310.10	Land	1,016,248													
317.00	Asset Retirement Costs	351,809					2,557,318								
340.10	Land	17,319													
347.00	Asset Retirement Costs	171,851					304,785								
350.10	Land	1,250,443													
360.10	Land	4,704,507													
370.00	Meters	4,402,487					9,850								
374.00	Asset Retirement Costs	1,094,399					1,278,359								
389.10	Land	1,530,800													
389.10	Land Common	9,369,110													
391.30	ESCC Computers	197,598					212,729								
399.00	Asset Retirement Costs	111,025					6,321								
	Total Accounts Not Studied	24,243,884					4,369,362								
	Total Electric Plant	$ 3,578,611,903					$ 1,351,651,944								

[1] Original cost of plant at 12-31-15 from the Depreciation Study
[2] Selected Iowa curve type and average life through mathematical and visual curve fitting techniques and professional judgement
[3] For life span accounts, weighted net salvage considering interim and terminal retirements. For mass accounts, estimated net salvage through historical analysis.
[4] = [1]*(1-[3])

Depreciation Rate Development
(SL-AL-RL-BG System)

		[1]	[2]		[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
Account		Original	Iowa Curve		Net	Depreciable	Book	Future	Remaining	Service Life		Net Salvage		Total	
No.	Description	Cost	Type	AL	Salvage	Base	Reserve	Accruals	Life	Accrual	Rate	Accrual	Rate	Accrual	Rate

[5] From the Company's property records
[6] = [4] - [5]
[7] Average remaining life based on Iowas Curve in Column [2]
[8] = ([1] - [5]) / [7]
[9] = [8] / [1]
[10] = [12] - [8]
[11] = [13] - [9]
[12] = [6] / [7]
[13] = [12] / [1]. Some unadjusted rates may be hard coded to match the Company's proposed rate.

Account 355 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] SPPC R3-70	[5] NNUC R2-77	[6] SPPC SSD	[7] NNUC SSD
0.0	92,904,974	100.00%	100.00%	100.00%	0.0000	0.0000
0.5	89,379,463	98.98%	99.99%	99.94%	0.0001	0.0001
1.5	83,572,479	98.91%	99.97%	99.81%	0.0001	0.0001
2.5	81,245,240	98.70%	99.94%	99.68%	0.0002	0.0001
3.5	80,343,081	98.52%	99.91%	99.54%	0.0002	0.0001
4.5	77,544,123	98.16%	99.87%	99.40%	0.0003	0.0002
5.5	75,250,771	98.07%	99.84%	99.25%	0.0003	0.0001
6.5	68,258,906	97.84%	99.79%	99.09%	0.0004	0.0002
7.5	67,220,196	97.82%	99.75%	98.93%	0.0004	0.0001
8.5	66,765,662	97.54%	99.70%	98.76%	0.0005	0.0001
9.5	57,357,168	97.51%	99.64%	98.58%	0.0005	0.0001
10.5	49,690,989	97.32%	99.57%	98.39%	0.0005	0.0001
11.5	46,839,169	97.01%	99.50%	98.20%	0.0006	0.0001
12.5	46,775,691	96.92%	99.43%	98.00%	0.0006	0.0001
13.5	46,334,469	96.72%	99.34%	97.79%	0.0007	0.0001
14.5	45,725,995	96.67%	99.25%	97.58%	0.0007	0.0001
15.5	45,143,137	96.65%	99.15%	97.35%	0.0006	0.0000
16.5	42,302,307	96.62%	99.04%	97.12%	0.0006	0.0000
17.5	29,982,887	95.82%	98.92%	96.87%	0.0010	0.0001
18.5	29,356,158	95.67%	98.79%	96.62%	0.0010	0.0001
19.5	29,001,315	95.56%	98.65%	96.36%	0.0010	0.0001
20.5	28,274,422	95.44%	98.49%	96.09%	0.0009	0.0000
21.5	27,767,347	95.37%	98.33%	95.80%	0.0009	0.0000
22.5	27,390,323	95.34%	98.15%	95.51%	0.0008	0.0000
23.5	26,590,484	94.85%	97.96%	95.21%	0.0010	0.0000
24.5	26,401,763	94.76%	97.75%	94.89%	0.0009	0.0000
25.5	25,518,604	94.69%	97.53%	94.56%	0.0008	0.0000
26.5	25,074,716	94.56%	97.29%	94.23%	0.0007	0.0000
27.5	23,445,797	94.47%	97.03%	93.88%	0.0007	0.0000
28.5	23,095,591	94.44%	96.75%	93.51%	0.0005	0.0001
29.5	22,931,566	94.15%	96.46%	93.14%	0.0005	0.0001
30.5	22,639,660	93.06%	96.15%	92.75%	0.0010	0.0000
31.5	19,363,381	92.96%	95.81%	92.35%	0.0008	0.0000
32.5	19,292,342	92.88%	95.46%	91.93%	0.0007	0.0001
33.5	17,721,522	92.38%	95.08%	91.50%	0.0007	0.0001
34.5	13,787,054	92.35%	94.67%	91.06%	0.0005	0.0002
35.5	13,696,207	92.10%	94.25%	90.60%	0.0005	0.0002
36.5	13,353,582	91.60%	93.80%	90.12%	0.0005	0.0002
37.5	12,136,965	91.59%	93.32%	89.63%	0.0003	0.0004
38.5	8,770,981	91.46%	92.81%	89.13%	0.0002	0.0005
39.5	8,735,024	91.24%	92.27%	88.60%	0.0001	0.0007
40.5	4,842,787	90.98%	91.71%	88.06%	0.0001	0.0009
41.5	4,279,103	90.29%	91.11%	87.51%	0.0001	0.0008
42.5	4,123,232	87.42%	90.48%	86.93%	0.0009	0.0000
43.5	3,649,223	87.34%	89.81%	86.34%	0.0006	0.0001
44.5	3,133,891	87.17%	89.11%	85.73%	0.0004	0.0002
45.5	3,076,341	85.60%	88.38%	85.10%	0.0008	0.0000
46.5	2,506,955	85.12%	87.60%	84.45%	0.0006	0.0000
47.5	2,472,550	84.15%	86.79%	83.78%	0.0007	0.0000
48.5	1,833,185	84.10%	85.93%	83.09%	0.0003	0.0001
49.5	1,680,150	83.56%	85.03%	82.38%	0.0002	0.0001
50.5	1,380,812	83.33%	84.09%	81.65%	0.0001	0.0003
51.5	1,046,869	82.68%	83.10%	80.90%	0.0000	0.0003
52.5	1,033,180	82.68%	82.07%	80.13%	0.0000	0.0007
53.5	915,710	82.07%	80.97%	79.33%	0.0001	0.0007
54.5	883,958	81.90%	79.84%	78.52%	0.0004	0.0011
55.5	835,297	81.63%	78.64%	77.68%	0.0009	0.0016
56.5	834,391	81.57%	77.39%	76.82%	0.0017	0.0023
57.5	788,506	77.52%	76.09%	75.93%	0.0002	0.0003

Account 355 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] SPPC R3-70	[5] NNUC R2-77	[6] SPPC SSD	[7] NNUC SSD
58.5	359,498	76.45%	74.72%	75.02%	0.0003	0.0002
59.5	311,452	69.93%	73.30%	74.09%	0.0011	0.0017
60.5	307,223	68.98%	71.82%	73.13%	0.0008	0.0017
61.5	306,159	68.79%	70.27%	72.16%	0.0002	0.0011
62.5	253,674	68.16%	68.67%	71.15%	0.0000	0.0009
63.5	209,885	67.97%	67.00%	70.12%	0.0001	0.0005
64.5	36,821	67.96%	65.27%	69.07%	0.0007	0.0001
65.5	36,468	67.31%	63.48%	68.00%	0.0015	0.0000
66.5	36,559	67.31%	61.63%	66.90%	0.0032	0.0000
67.5	33,075	61.06%	59.73%	65.78%	0.0002	0.0022
68.5	33,075	61.06%	57.77%	64.63%	0.0011	0.0013
69.5	33,042	61.00%	55.76%	63.46%	0.0027	0.0006
70.5	32,770	60.50%	53.71%	62.27%	0.0046	0.0003
71.5	32,535	59.88%	51.61%	61.06%	0.0068	0.0001
72.5	58,019	59.88%	49.48%	59.82%	0.0108	0.0000
73.5	58,019	59.88%	47.32%	58.57%	0.0158	0.0002
74.5	52,705	54.40%	45.13%	57.29%	0.0086	0.0008
75.5	52,069	53.74%	42.93%	56.00%	0.0117	0.0005
76.5	51,383	53.14%	40.72%	54.69%	0.0154	0.0002
77.5	22,932	53.14%	38.51%	53.36%	0.0214	0.0000
78.5	22,932	53.14%	36.32%	52.01%	0.0283	0.0001
79.5	22,932	53.14%	34.14%	50.65%	0.0361	0.0006
80.5	22,932	53.14%	31.98%	49.28%	0.0448	0.0015
81.5	22,932	53.14%	29.87%	47.89%	0.0542	0.0028
82.5	20,295	47.03%	27.79%	46.50%	0.0370	0.0000
83.5	20,295	47.03%	25.77%	45.09%	0.0452	0.0004
84.5	20,295	47.03%	23.81%	43.68%	0.0539	0.0011
85.5	20,295	47.03%	21.92%	42.26%	0.0631	0.0023
86.5	20,295	47.03%	20.10%	40.84%	0.0725	0.0038
87.5	16,060	37.21%	18.35%	39.42%	0.0356	0.0005
88.5	16,060	37.21%	16.70%	38.00%	0.0421	0.0001
89.5	16,060	37.21%	15.12%	36.58%	0.0488	0.0000
90.5	15,501	35.92%	13.64%	35.17%	0.0496	0.0001
91.5	15,421	35.73%	12.24%	33.77%	0.0552	0.0004
92.5		35.73%	10.94%	32.37%	0.0615	0.0011
Sum of Squared Differences				[8]	0.8661	0.0418
Up to 1% of Beginning Exposures				[9]	0.0278	0.0084

[1] Age in years using half-year convention
[2] Dollars exposed to retirement at the beginning of each age interval
[3] Observed life table based on the Company's property records. These numbers form the original survivor curve.
[4] The Company's selected Iowa curve to be fitted to the OLT.
[5] My selected Iowa curve to be fitted to the OLT.
[6] = ([4] - [3])^2. This is the squared difference between each point on the Company's curve and the observed survivor curve.
[7] = ([5] - [3])^2. This is the squared difference between each point on my curve and the observed survivor curve.
[8] = Sum of squared differences. The smallest SSD represents the best mathematical fit.
[9] = Sum of squared differences up to the 1% of beginning exposures cut-off.
*The bold horizontal line represents the 1% of beginning exposures cut-off.

Account 356 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] SPPC R4-65	[5] NNUC R4-67	[6] SPPC SSD	[7] NNUC SSD
0.0	159,577,546	100.00%	100.00%	100.00%	0.0000	0.0000
0.5	157,736,995	99.89%	100.00%	100.00%	0.0000	0.0000
1.5	157,265,948	99.74%	100.00%	100.00%	0.0000	0.0000
2.5	156,502,998	99.70%	100.00%	100.00%	0.0000	0.0000
3.5	155,897,888	99.68%	99.99%	99.99%	0.0000	0.0000
4.5	150,914,629	99.67%	99.99%	99.99%	0.0000	0.0000
5.5	145,147,655	99.52%	99.99%	99.99%	0.0000	0.0000
6.5	139,892,987	99.52%	99.98%	99.98%	0.0000	0.0000
7.5	133,029,629	99.46%	99.98%	99.98%	0.0000	0.0000
8.5	126,948,197	99.41%	99.97%	99.97%	0.0000	0.0000
9.5	123,191,984	99.39%	99.96%	99.97%	0.0000	0.0000
10.5	114,608,431	99.35%	99.95%	99.96%	0.0000	0.0000
11.5	95,775,886	99.33%	99.94%	99.95%	0.0000	0.0000
12.5	95,723,643	99.32%	99.93%	99.93%	0.0000	0.0000
13.5	95,560,496	99.15%	99.91%	99.92%	0.0001	0.0001
14.5	95,403,284	99.11%	99.89%	99.90%	0.0001	0.0001
15.5	93,911,194	99.11%	99.87%	99.88%	0.0001	0.0001
16.5	90,276,035	99.11%	99.84%	99.86%	0.0001	0.0001
17.5	47,629,734	98.99%	99.81%	99.83%	0.0001	0.0001
18.5	47,685,295	98.98%	99.77%	99.79%	0.0001	0.0001
19.5	47,451,086	98.96%	99.73%	99.76%	0.0001	0.0001
20.5	47,078,297	98.88%	99.68%	99.71%	0.0001	0.0001
21.5	46,595,530	98.88%	99.62%	99.66%	0.0001	0.0001
22.5	45,624,359	98.87%	99.55%	99.60%	0.0000	0.0001
23.5	45,105,455	98.79%	99.47%	99.53%	0.0000	0.0001
24.5	44,710,880	98.67%	99.38%	99.45%	0.0001	0.0001
25.5	43,755,484	98.66%	99.28%	99.36%	0.0000	0.0000
26.5	43,397,114	98.66%	99.16%	99.26%	0.0000	0.0000
27.5	42,816,913	98.64%	99.03%	99.14%	0.0000	0.0000
28.5	42,653,304	98.56%	98.87%	99.00%	0.0000	0.0000
29.5	42,370,670	98.55%	98.70%	98.85%	0.0000	0.0000
30.5	42,281,055	98.50%	98.51%	98.68%	0.0000	0.0000
31.5	42,245,287	98.50%	98.29%	98.49%	0.0000	0.0000
32.5	42,085,351	98.48%	98.04%	98.28%	0.0000	0.0000
33.5	41,945,287	98.39%	97.76%	98.04%	0.0000	0.0000
34.5	26,814,332	98.39%	97.46%	97.77%	0.0001	0.0000
35.5	16,517,526	98.19%	97.11%	97.48%	0.0001	0.0001
36.5	12,684,604	97.94%	96.73%	97.14%	0.0001	0.0001
37.5	12,408,841	97.94%	96.31%	96.78%	0.0003	0.0001
38.5	8,442,088	97.94%	95.84%	96.37%	0.0004	0.0002
39.5	8,410,071	97.86%	95.33%	95.93%	0.0006	0.0004
40.5	5,171,630	96.14%	94.77%	95.44%	0.0002	0.0000
41.5	4,820,921	92.24%	94.15%	94.91%	0.0004	0.0007
42.5	3,979,279	92.15%	93.47%	94.32%	0.0002	0.0005
43.5	3,749,223	92.12%	92.74%	93.68%	0.0000	0.0002
44.5	3,422,580	91.79%	91.94%	92.99%	0.0000	0.0001
45.5	3,406,752	91.60%	91.07%	92.23%	0.0000	0.0000
46.5	2,666,110	91.43%	90.13%	91.42%	0.0002	0.0000
47.5	2,639,367	90.70%	89.13%	90.54%	0.0002	0.0000
48.5	1,946,042	89.81%	88.04%	89.58%	0.0003	0.0000
49.5	1,491,212	89.81%	86.87%	88.57%	0.0009	0.0002
50.5	1,498,481	89.81%	85.63%	87.47%	0.0018	0.0005
51.5	1,021,079	89.79%	84.30%	86.31%	0.0030	0.0012
52.5	1,021,722	89.78%	82.88%	85.06%	0.0048	0.0022
53.5	1,028,395	89.78%	81.38%	83.74%	0.0071	0.0037
54.5	968,208	85.52%	79.80%	82.33%	0.0033	0.0010
55.5	937,156	85.52%	78.12%	80.85%	0.0055	0.0022
56.5	928,667	84.75%	76.34%	79.28%	0.0071	0.0030
57.5	694,331	64.20%	74.44%	77.63%	0.0105	0.0180

Account 356 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] SPPC R4-65	[5] NNUC R4-67	[6] SPPC SSD	[7] NNUC SSD
58.5	214,889	64.20%	72.42%	75.87%	0.0068	0.0136
59.5	171,545	54.69%	70.23%	74.00%	0.0242	0.0373
60.5	171,545	54.69%	67.90%	72.00%	0.0175	0.0300
61.5	171,545	54.69%	65.39%	69.86%	0.0115	0.0230
62.5	200,772	54.69%	62.73%	67.57%	0.0065	0.0166
63.5	134,341	54.39%	59.89%	65.12%	0.0030	0.0115
64.5	81,940	54.39%	56.91%	62.52%	0.0006	0.0066
65.5	81,940	54.39%	53.80%	59.76%	0.0000	0.0029
66.5	81,984	54.39%	50.59%	56.87%	0.0014	0.0006
67.5	58,258	54.39%	47.29%	53.85%	0.0050	0.0000
68.5	58,258	54.39%	43.95%	50.73%	0.0109	0.0013
69.5	58,258	54.39%	40.60%	47.54%	0.0190	0.0047
70.5	58,258	54.39%	37.26%	44.30%	0.0293	0.0102
71.5	58,383	54.39%	33.97%	41.05%	0.0417	0.0178
72.5	71,178	54.39%	30.78%	37.81%	0.0557	0.0275
73.5	71,178	54.39%	27.68%	34.61%	0.0713	0.0391
74.5	71,178	54.39%	24.73%	31.49%	0.0880	0.0525
75.5	71,178	54.39%	21.92%	28.46%	0.1054	0.0672
76.5	70,654	54.39%	19.29%	25.55%	0.1232	0.0832
77.5	51,392	54.39%	16.83%	22.79%	0.1411	0.0999
78.5	51,392	54.39%	14.55%	20.17%	0.1587	0.1171
79.5	51,392	54.39%	12.47%	17.73%	0.1757	0.1344
80.5	51,391	54.39%	10.58%	15.45%	0.1920	0.1517
81.5	51,391	54.39%	8.87%	13.35%	0.2072	0.1684
82.5	51,391	54.39%	7.34%	11.43%	0.2214	0.1846
83.5	51,391	54.39%	6.00%	9.69%	0.2342	0.1998
84.5	51,391	54.39%	4.81%	8.12%	0.2459	0.2141
85.5	51,391	54.39%	3.79%	6.72%	0.2560	0.2272
86.5	51,391	54.39%	2.92%	5.48%	0.2649	0.2392
87.5	41,016	54.39%	2.19%	4.40%	0.2724	0.2499
88.5	41,016	54.39%	1.59%	3.46%	0.2787	0.2594
89.5	41,016	54.39%	1.12%	2.67%	0.2838	0.2675
90.5	41,016	54.39%	0.75%	2.00%	0.2877	0.2745
91.5	41,016	54.39%	0.47%	1.46%	0.2907	0.2802
92.5		54.39%	0.28%	1.02%	0.2928	0.2849
Sum of Squared Differences				[8]	4.4723	3.8342
Up to 1% of Beginning Exposures				[9]	0.0043	0.0037

[1] Age in years using half-year convention
[2] Dollars exposed to retirement at the beginning of each age interval
[3] Observed life table based on the Company's property records. These numbers form the original survivor curve.
[4] The Company's selected Iowa curve to be fitted to the OLT.
[5] My selected Iowa curve to be fitted to the OLT.
[6] = ([4] - [3])^2. This is the squared difference between each point on the Company's curve and the observed survivor curve.
[7] = ([5] - [3])^2. This is the squared difference between each point on my curve and the observed survivor curve.
[8] = Sum of squared differences. The smallest SSD represents the best mathematical fit.
[9] = Sum of squared differences up to the 1% of beginning exposures cut-off.
*The bold horizontal line represents the 1% of beginning exposures cut-off.

Account 361 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] SPPC R3-55	[5] NNUC R2-89	[6] SPPC SSD	[7] NNUC SSD
0.0	4,487,891	100.00%	100.00%	100.00%	0.0000	0.0000
0.5	4,487,891	100.00%	99.99%	99.95%	0.0000	0.0000
1.5	4,487,891	100.00%	99.95%	99.84%	0.0000	0.0000
2.5	4,457,160	100.00%	99.92%	99.73%	0.0000	0.0000
3.5	3,933,928	99.98%	99.88%	99.61%	0.0000	0.0000
4.5	3,933,678	99.98%	99.83%	99.49%	0.0000	0.0000
5.5	2,868,539	99.94%	99.77%	99.36%	0.0000	0.0000
6.5	1,821,014	99.90%	99.71%	99.23%	0.0000	0.0000
7.5	1,619,928	99.89%	99.64%	99.09%	0.0000	0.0001
8.5	1,618,945	99.89%	99.55%	98.95%	0.0000	0.0001
9.5	1,608,222	99.89%	99.46%	98.81%	0.0000	0.0001
10.5	1,608,027	99.88%	99.36%	98.65%	0.0000	0.0002
11.5	1,444,929	99.88%	99.24%	98.50%	0.0000	0.0002
12.5	1,444,929	99.88%	99.11%	98.33%	0.0001	0.0002
13.5	1,418,738	98.07%	98.96%	98.17%	0.0001	0.0000
14.5	1,400,418	96.80%	98.80%	97.99%	0.0004	0.0001
15.5	1,387,273	95.89%	98.61%	97.81%	0.0007	0.0004
16.5	1,275,350	95.89%	98.41%	97.62%	0.0006	0.0003
17.5	1,088,892	95.89%	98.19%	97.43%	0.0005	0.0002
18.5	1,085,010	95.79%	97.95%	97.23%	0.0005	0.0002
19.5	1,034,076	95.79%	97.68%	97.03%	0.0004	0.0002
20.5	933,132	95.79%	97.39%	96.81%	0.0003	0.0001
21.5	928,994	95.53%	97.07%	96.59%	0.0002	0.0001
22.5	892,395	95.51%	96.72%	96.37%	0.0001	0.0001
23.5	882,306	94.71%	96.33%	96.13%	0.0003	0.0002
24.5	881,659	94.71%	95.92%	95.89%	0.0001	0.0001
25.5	872,251	94.71%	95.47%	95.64%	0.0001	0.0001
26.5	858,722	94.71%	94.99%	95.38%	0.0000	0.0000
27.5	841,439	94.71%	94.47%	95.12%	0.0000	0.0000
28.5	831,665	94.71%	93.90%	94.84%	0.0001	0.0000
29.5	799,345	94.71%	93.29%	94.56%	0.0002	0.0000
30.5	733,128	94.71%	92.64%	94.26%	0.0004	0.0000
31.5	725,784	94.71%	91.94%	93.96%	0.0008	0.0001
32.5	639,270	90.21%	91.19%	93.65%	0.0001	0.0012
33.5	639,270	90.21%	90.39%	93.33%	0.0000	0.0010
34.5	639,270	90.21%	89.53%	93.00%	0.0000	0.0008
35.5	633,559	90.21%	88.62%	92.66%	0.0003	0.0006
36.5	612,947	90.21%	87.64%	92.32%	0.0007	0.0004
37.5	595,357	90.21%	86.60%	91.95%	0.0013	0.0003
38.5	592,743	90.21%	85.49%	91.58%	0.0022	0.0002
39.5	569,330	89.98%	84.31%	91.20%	0.0032	0.0001
40.5	536,943	89.88%	83.06%	90.81%	0.0047	0.0001
41.5	454,908	89.88%	81.72%	90.41%	0.0067	0.0000
42.5	450,336	89.88%	80.31%	89.99%	0.0092	0.0000
43.5	448,781	89.84%	78.81%	89.57%	0.0122	0.0000
44.5	416,986	87.91%	77.22%	89.13%	0.0114	0.0001
45.5	368,827	87.91%	75.54%	88.67%	0.0153	0.0001
46.5	318,089	87.91%	73.76%	88.21%	0.0200	0.0000
47.5	284,014	87.91%	71.88%	87.73%	0.0257	0.0000
48.5	261,768	87.36%	69.91%	87.24%	0.0304	0.0000
49.5	239,401	87.36%	67.84%	86.74%	0.0381	0.0000
50.5	233,996	87.36%	65.67%	86.22%	0.0471	0.0001

Account 361 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] SPPC R3-55	[5] NNUC R2-89	[6] SPPC SSD	[7] NNUC SSD
51.5	226,486	87.36%	63.40%	85.69%	0.0574	0.0003
52.5	163,932	86.55%	61.03%	85.15%	0.0651	0.0002
53.5	123,125	86.55%	58.58%	84.59%	0.0783	0.0004
54.5	121,342	86.55%	56.04%	84.02%	0.0931	0.0006
55.5	105,154	86.55%	53.42%	83.43%	0.1097	0.0010
56.5	95,824	86.55%	50.74%	82.82%	0.1282	0.0014
57.5	88,064	86.55%	48.01%	82.20%	0.1486	0.0019
58.5	82,183	86.55%	45.23%	81.57%	0.1707	0.0025
59.5	78,010	86.55%	42.43%	80.92%	0.1947	0.0032
60.5	68,077	86.55%	39.62%	80.25%	0.2203	0.0040
61.5	58,117	86.55%	36.82%	79.57%	0.2474	0.0049
62.5	55,734	86.51%	34.04%	78.87%	0.2753	0.0058
63.5	45,154	86.47%	31.31%	78.15%	0.3043	0.0069
64.5	41,863	86.42%	28.64%	77.42%	0.3339	0.0081
65.5	39,185	86.37%	26.04%	76.67%	0.3639	0.0094
66.5	31,759	86.37%	23.55%	75.90%	0.3947	0.0110
67.5	29,217	86.37%	21.16%	75.12%	0.4252	0.0127
68.5	28,365	86.37%	18.90%	74.31%	0.4552	0.0145
69.5	27,788	86.37%	16.77%	73.49%	0.4844	0.0166
70.5	27,788	86.37%	14.78%	72.65%	0.5126	0.0188
71.5	27,788	86.37%	12.93%	71.80%	0.5394	0.0212
72.5	27,788	86.37%	11.23%	70.92%	0.5646	0.0239
73.5	27,590	86.37%	9.68%	70.03%	0.5882	0.0267
74.5	25,771	86.37%	8.27%	69.12%	0.6100	0.0298
75.5	20,138	70.91%	6.99%	68.19%	0.4085	0.0007
76.5	15,473	54.67%	5.86%	67.25%	0.2383	0.0158
77.5	15,834	54.67%	4.85%	66.28%	0.2482	0.0135
78.5		54.67%	3.96%	65.30%	0.2571	0.0113
Sum of Squared Differences				[8]	8.7518	0.2754
Up to 1% of Beginning Exposures				[9]	2.3275	0.0414

[1] Age in years using half-year convention
[2] Dollars exposed to retirement at the beginning of each age interval
[3] Observed life table based on the Company's property records. These numbers form the original survivor curve.
[4] The Company's selected Iowa curve to be fitted to the OLT.
[5] My selected Iowa curve to be fitted to the OLT.
[6] = ([4] - [3])^2. This is the squared difference between each point on the Company's curve and the observed survivor curve.
[7] = ([5] - [3])^2. This is the squared difference between each point on my curve and the observed survivor curve.
[8] = Sum of squared differences. The smallest SSD represents the best mathematical fit.
[9] = Sum of squared differences up to the 1% of beginning exposures cut-off.
*The bold horizontal line represents the 1% of beginning exposures cut-off.

Account 364 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] SPPC R2-65	[5] NNUC R1-68	[6] SPPC SSD	[7] NNUC SSD
0.0	213,174,406	100.00%	100.00%	100.00%	0.0000	0.0000
0.5	194,337,199	99.81%	99.93%	99.81%	0.0000	0.0000
1.5	191,513,201	99.13%	99.78%	99.43%	0.0000	0.0000
2.5	180,502,931	98.50%	99.62%	99.03%	0.0001	0.0000
3.5	172,409,276	97.92%	99.45%	98.63%	0.0002	0.0001
4.5	167,328,563	97.36%	99.27%	98.22%	0.0004	0.0001
5.5	164,010,706	96.74%	99.09%	97.81%	0.0006	0.0001
6.5	159,847,498	96.13%	98.89%	97.38%	0.0008	0.0002
7.5	149,270,051	95.59%	98.69%	96.95%	0.0010	0.0002
8.5	143,179,154	94.98%	98.47%	96.51%	0.0012	0.0002
9.5	137,249,219	94.43%	98.25%	96.06%	0.0015	0.0003
10.5	131,490,382	93.72%	98.01%	95.61%	0.0018	0.0004
11.5	130,135,710	93.07%	97.77%	95.15%	0.0022	0.0004
12.5	126,250,015	92.56%	97.51%	94.68%	0.0024	0.0004
13.5	127,862,180	92.08%	97.24%	94.20%	0.0027	0.0004
14.5	129,699,367	91.58%	96.95%	93.71%	0.0029	0.0005
15.5	122,530,396	91.03%	96.66%	93.22%	0.0032	0.0005
16.5	114,870,484	90.47%	96.35%	92.72%	0.0035	0.0005
17.5	109,422,664	90.02%	96.02%	92.21%	0.0036	0.0005
18.5	105,137,520	89.48%	95.68%	91.69%	0.0038	0.0005
19.5	99,241,332	89.07%	95.33%	91.17%	0.0039	0.0004
20.5	96,150,853	88.67%	94.96%	90.64%	0.0040	0.0004
21.5	89,516,321	88.19%	94.58%	90.10%	0.0041	0.0004
22.5	85,388,214	87.69%	94.17%	89.56%	0.0042	0.0003
23.5	79,372,392	86.88%	93.75%	89.00%	0.0047	0.0005
24.5	75,156,143	86.45%	93.32%	88.44%	0.0047	0.0004
25.5	70,004,857	85.89%	92.86%	87.87%	0.0049	0.0004
26.5	59,985,052	85.52%	92.39%	87.29%	0.0047	0.0003
27.5	52,820,431	85.10%	91.90%	86.71%	0.0046	0.0003
28.5	48,165,052	84.55%	91.39%	86.11%	0.0047	0.0002
29.5	42,748,079	83.90%	90.85%	85.51%	0.0048	0.0003
30.5	40,447,803	83.59%	90.30%	84.89%	0.0045	0.0002
31.5	37,922,818	83.17%	89.72%	84.27%	0.0043	0.0001
32.5	36,275,083	82.79%	89.13%	83.64%	0.0040	0.0001
33.5	33,471,282	82.34%	88.50%	82.99%	0.0038	0.0000
34.5	29,818,877	81.82%	87.86%	82.34%	0.0036	0.0000
35.5	26,246,578	81.31%	87.19%	81.67%	0.0035	0.0000
36.5	24,649,703	80.97%	86.50%	80.99%	0.0031	0.0000
37.5	22,799,372	80.54%	85.78%	80.30%	0.0027	0.0000
38.5	20,776,027	80.11%	85.03%	79.60%	0.0024	0.0000
39.5	18,437,128	79.10%	84.26%	78.88%	0.0027	0.0000
40.5	16,099,963	78.65%	83.45%	78.16%	0.0023	0.0000
41.5	12,218,942	77.97%	82.62%	77.42%	0.0022	0.0000
42.5	11,153,860	77.39%	81.77%	76.66%	0.0019	0.0001
43.5	10,070,824	76.91%	80.88%	75.90%	0.0016	0.0001
44.5	9,265,554	76.36%	79.96%	75.12%	0.0013	0.0002
45.5	8,672,503	75.55%	79.01%	74.33%	0.0012	0.0001
46.5	7,365,862	74.51%	78.03%	73.52%	0.0012	0.0001
47.5	6,753,863	73.82%	77.02%	72.70%	0.0010	0.0001
48.5	6,139,951	73.30%	75.97%	71.86%	0.0007	0.0002
49.5	5,710,187	72.72%	74.89%	71.01%	0.0005	0.0003
50.5	4,983,753	71.78%	73.78%	70.15%	0.0004	0.0003
51.5	4,363,706	71.25%	72.64%	69.27%	0.0002	0.0004
52.5	3,615,316	70.80%	71.46%	68.38%	0.0000	0.0006
53.5	2,990,301	70.29%	70.25%	67.48%	0.0000	0.0008
54.5	2,557,521	69.54%	69.01%	66.56%	0.0000	0.0009
55.5	2,211,639	68.79%	67.73%	65.63%	0.0001	0.0010
56.5	1,944,997	68.07%	66.42%	64.68%	0.0003	0.0011
57.5	1,782,765	67.62%	65.07%	63.72%	0.0006	0.0015
58.5	1,565,943	65.85%	63.70%	62.75%	0.0005	0.0010
59.5	1,291,556	64.97%	62.29%	61.76%	0.0007	0.0010
60.5	1,101,500	64.43%	60.85%	60.76%	0.0013	0.0013
61.5	990,626	63.51%	59.38%	59.75%	0.0017	0.0014

Account 364 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] SPPC R2-65	[5] NNUC R1-68	[6] SPPC SSD	[7] NNUC SSD
62.5	772,126	62.90%	57.88%	58.73%	0.0025	0.0017
63.5	673,677	62.38%	56.36%	57.69%	0.0036	0.0022
64.5	499,272	60.53%	54.81%	56.64%	0.0033	0.0015
65.5	482,963	59.78%	53.23%	55.58%	0.0043	0.0018
66.5	443,423	58.34%	51.64%	54.52%	0.0045	0.0015
67.5	390,093	58.24%	50.02%	53.44%	0.0068	0.0023
68.5	387,384	57.95%	48.38%	52.35%	0.0092	0.0031
69.5	374,383	57.65%	46.73%	51.25%	0.0119	0.0041
70.5	370,309	57.22%	45.07%	50.15%	0.0148	0.0050
71.5	366,827	56.91%	43.40%	49.03%	0.0183	0.0062
72.5	319,104	55.70%	41.72%	47.91%	0.0196	0.0061
73.5	314,849	55.36%	40.03%	46.78%	0.0235	0.0074
74.5	302,348	54.34%	38.35%	45.65%	0.0256	0.0076
75.5	230,705	41.59%	36.67%	44.51%	0.0024	0.0009
76.5	158,527	28.58%	35.00%	43.37%	0.0041	0.0219
77.5	149,821	28.30%	33.34%	42.22%	0.0025	0.0194
78.5	134,268	28.29%	31.69%	41.07%	0.0012	0.0163
79.5	130,483	28.29%	30.06%	39.92%	0.0003	0.0135
80.5	116,677	28.24%	28.46%	38.77%	0.0000	0.0111
81.5	116,650	28.24%	26.88%	37.62%	0.0002	0.0088
82.5	91,040	28.20%	25.32%	36.46%	0.0008	0.0068
83.5	91,040	28.20%	23.80%	35.31%	0.0019	0.0051
84.5	91,040	28.20%	22.32%	34.17%	0.0035	0.0036
85.5	90,480	28.02%	20.88%	33.02%	0.0051	0.0025
86.5	86,347	26.74%	19.47%	31.88%	0.0053	0.0026
87.5	82,368	25.51%	18.12%	30.75%	0.0055	0.0027
88.5	74,833	25.51%	16.81%	29.62%	0.0076	0.0017
89.5	58,212	25.51%	15.54%	28.50%	0.0099	0.0009
90.5	58,212	25.51%	14.33%	27.39%	0.0125	0.0004
91.5	58,212	25.51%	13.17%	26.28%	0.0152	0.0001
92.5	58,212	25.51%	12.06%	25.19%	0.0181	0.0000
93.5	58,212	25.51%	11.01%	24.11%	0.0210	0.0002
94.5	58,212	25.51%	10.01%	23.05%	0.0240	0.0006
95.5	57,960	25.40%	9.06%	21.99%	0.0267	0.0012
96.5	57,960	25.40%	8.17%	20.95%	0.0297	0.0020
97.5	57,740	25.30%	7.33%	19.93%	0.0323	0.0029
98.5	41,136	19.07%	6.55%	18.93%	0.0157	0.0000
99.5	19,928	12.30%	5.81%	17.94%	0.0042	0.0032
100.5	19,928	12.30%	5.13%	16.97%	0.0051	0.0022
101.5		12.30%	4.49%	16.02%	0.0061	0.0014
Sum of Squared Differences				[8]	0.5441	0.2043
Up to 1% of Beginning Exposures				[9]	0.1304	0.0147

[1] Age in years using half-year convention
[2] Dollars exposed to retirement at the beginning of each age interval
[3] Observed life table based on the Company's property records. These numbers form the original survivor curve.
[4] The Company's selected Iowa curve to be fitted to the OLT.
[5] My selected Iowa curve to be fitted to the OLT.
[6] = ([4] - [3])^2. This is the squared difference between each point on the Company's curve and the observed survivor curve.
[7] = ([5] - [3])^2. This is the squared difference between each point on my curve and the observed survivor curve.
[8] = Sum of squared differences. The smallest SSD represents the best mathematical fit.
[9] = Sum of squared differences up to the 1% of beginning exposures cut-off.
*The bold horizontal line represents the 1% of beginning exposures cut-off.

Account 367 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] SPPC R3-60	[5] NNUC S1-75	[6] SPPC SSD	[7] NNUC SSD
0.0	371,966,779	100.00%	100.00%	100.00%	0.0000	0.0000
0.5	362,737,323	99.72%	99.99%	100.00%	0.0000	0.0000
1.5	355,559,740	99.70%	99.96%	100.00%	0.0000	0.0000
2.5	346,281,916	99.68%	99.93%	99.99%	0.0000	0.0000
3.5	334,544,264	99.65%	99.89%	99.98%	0.0000	0.0000
4.5	327,576,657	99.62%	99.85%	99.96%	0.0000	0.0000
5.5	319,198,608	99.51%	99.80%	99.93%	0.0000	0.0000
6.5	304,800,332	99.45%	99.74%	99.89%	0.0000	0.0000
7.5	287,441,233	99.36%	99.68%	99.84%	0.0000	0.0000
8.5	253,211,156	99.29%	99.61%	99.78%	0.0000	0.0000
9.5	234,521,872	99.22%	99.53%	99.70%	0.0000	0.0000
10.5	215,653,158	99.15%	99.45%	99.60%	0.0000	0.0000
11.5	193,977,358	99.03%	99.35%	99.49%	0.0000	0.0000
12.5	175,589,823	98.93%	99.24%	99.36%	0.0000	0.0000
13.5	168,268,694	98.69%	99.12%	99.21%	0.0000	0.0000
14.5	155,129,839	98.48%	98.99%	99.04%	0.0000	0.0000
15.5	139,443,301	98.34%	98.85%	98.86%	0.0000	0.0000
16.5	130,585,583	98.26%	98.68%	98.65%	0.0000	0.0000
17.5	118,233,260	98.00%	98.51%	98.42%	0.0000	0.0000
18.5	105,532,654	97.76%	98.31%	98.17%	0.0000	0.0000
19.5	98,135,507	97.45%	98.10%	97.90%	0.0000	0.0000
20.5	90,975,312	97.16%	97.87%	97.60%	0.0001	0.0000
21.5	83,178,358	96.92%	97.62%	97.28%	0.0000	0.0000
22.5	78,222,410	96.41%	97.35%	96.94%	0.0001	0.0000
23.5	70,633,934	95.67%	97.05%	96.58%	0.0002	0.0001
24.5	63,589,060	95.14%	96.73%	96.19%	0.0003	0.0001
25.5	57,567,946	94.81%	96.38%	95.78%	0.0002	0.0001
26.5	52,042,621	94.68%	96.01%	95.34%	0.0002	0.0000
27.5	47,048,461	94.61%	95.61%	94.88%	0.0001	0.0000
28.5	42,246,310	94.39%	95.17%	94.39%	0.0001	0.0000
29.5	35,709,580	94.07%	94.71%	93.88%	0.0000	0.0000
30.5	33,778,017	93.84%	94.21%	93.34%	0.0000	0.0000
31.5	31,544,334	93.60%	93.68%	92.78%	0.0000	0.0001
32.5	29,543,864	93.08%	93.11%	92.20%	0.0000	0.0001
33.5	26,835,262	92.04%	92.50%	91.59%	0.0000	0.0000
34.5	21,904,520	91.49%	91.85%	90.96%	0.0000	0.0000
35.5	17,679,772	90.06%	91.16%	90.30%	0.0001	0.0000
36.5	15,493,253	89.65%	90.42%	89.62%	0.0001	0.0000
37.5	11,780,556	89.08%	89.64%	88.92%	0.0000	0.0000
38.5	10,258,249	88.42%	88.81%	88.19%	0.0000	0.0000
39.5	8,849,683	87.59%	87.93%	87.44%	0.0000	0.0000
40.5	7,573,609	87.11%	87.00%	86.67%	0.0000	0.0000
41.5	5,939,441	86.30%	86.01%	85.87%	0.0000	0.0000
42.5	5,128,525	86.14%	84.96%	85.06%	0.0001	0.0001
43.5	3,725,015	85.94%	83.85%	84.22%	0.0004	0.0003
44.5	3,155,771	85.29%	82.68%	83.36%	0.0007	0.0004
45.5	2,441,813	83.97%	81.44%	82.48%	0.0006	0.0002
46.5	1,989,141	83.66%	80.12%	81.58%	0.0013	0.0004
47.5	1,612,932	83.57%	78.74%	80.66%	0.0023	0.0008
48.5	1,387,602	83.07%	77.29%	79.72%	0.0033	0.0011
49.5	1,183,473	82.11%	75.75%	78.76%	0.0040	0.0011
50.5	909,854	79.88%	74.14%	77.78%	0.0033	0.0004

Account 367 Curve Fitting

[1]	[2]	[3]	[4]	[5]	[6]	[7]
Age (Years)	**Exposures (Dollars)**	**Observed Life Table (OLT)**	**SPPC R3-60**	**NNUC S1-75**	**SPPC SSD**	**NNUC SSD**
51.5	813,033	79.65%	72.44%	76.79%	0.0052	0.0008
52.5	751,727	79.43%	70.66%	75.78%	0.0077	0.0013
53.5	744,989	79.10%	68.80%	74.75%	0.0106	0.0019
54.5	229,660	79.01%	66.86%	73.71%	0.0148	0.0028
55.5	211,630	77.66%	64.83%	72.65%	0.0165	0.0025
56.5	208,178	77.29%	62.72%	71.58%	0.0212	0.0033
57.5	159,287	71.65%	60.53%	70.49%	0.0124	0.0001
58.5	37,418	68.98%	58.26%	69.39%	0.0115	0.0000
59.5	20,851	45.04%	55.93%	68.28%	0.0119	0.0540
60.5	18,380	39.71%	53.53%	67.16%	0.0191	0.0753
61.5	10,150	21.93%	51.08%	66.02%	0.0850	0.1944
62.5	9,973	21.54%	48.58%	64.88%	0.0731	0.1878
63.5	9,301	20.09%	46.04%	63.72%	0.0674	0.1904
64.5	8,833	19.08%	43.48%	62.56%	0.0595	0.1891
65.5	8,338	18.01%	40.91%	61.39%	0.0524	0.1882
66.5	8,338	18.01%	38.33%	60.21%	0.0413	0.1781
67.5	8,315	17.96%	35.77%	59.03%	0.0317	0.1686
68.5	8,315	17.96%	33.24%	57.83%	0.0233	0.1590
69.5	8,313	17.96%	30.74%	56.64%	0.0163	0.1496
70.5	7,930	17.13%	28.31%	55.44%	0.0125	0.1467
71.5	1,163	2.51%	25.94%	54.23%	0.0549	0.2675
72.5	1,163	2.51%	23.65%	53.03%	0.0447	0.2552
73.5	1,163	2.51%	21.46%	51.82%	0.0359	0.2431
74.5	80	2.51%	19.36%	50.61%	0.0284	0.2313
75.5	80	2.51%	17.38%	49.39%	0.0221	0.2198
76.5	19	0.61%	15.51%	48.18%	0.0222	0.2263
77.5		0.00%	13.76%	46.98%	0.0189	0.2207
Sum of Squared Differences				[8]	0.8385	3.5640
Up to 1% of Beginning Exposures				[9]	0.0024	0.0015

[1] Age in years using half-year convention
[2] Dollars exposed to retirement at the beginning of each age interval
[3] Observed life table based on the Company's property records. These numbers form the original survivor curve.
[4] The Company's selected Iowa curve to be fitted to the OLT.
[5] My selected Iowa curve to be fitted to the OLT.
[6] = ([4] - [3])^2. This is the squared difference between each point on the Company's curve and the observed survivor curve.
[7] = ([5] - [3])^2. This is the squared difference between each point on my curve and the observed survivor curve.
[8] = Sum of squared differences. The smallest SSD represents the best mathematical fit.
[9] = Sum of squared differences up to the 1% of beginning exposures cut-off.
*The bold horizontal line represents the 1% of beginning exposures cut-off.

Account 368 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] SPPC R1-50	[5] NNUC R0.5-55	[6] SPPC SSD	[7] NNUC SSD
0.0	275,386,816	100.00%	100.00%	100.00%	0.0000	0.0000
0.5	263,940,233	99.82%	99.74%	100.00%	0.0000	0.0000
1.5	249,000,640	99.37%	99.21%	99.34%	0.0000	0.0000
2.5	233,016,040	98.91%	98.67%	98.65%	0.0000	0.0000
3.5	217,907,121	98.51%	98.12%	97.95%	0.0000	0.0000
4.5	204,780,162	97.96%	97.55%	97.24%	0.0000	0.0001
5.5	198,995,126	97.38%	96.96%	96.52%	0.0000	0.0001
6.5	189,004,577	96.84%	96.36%	95.80%	0.0000	0.0001
7.5	168,946,029	96.13%	95.75%	95.08%	0.0000	0.0001
8.5	162,988,102	95.45%	95.12%	94.34%	0.0000	0.0001
9.5	155,775,250	94.52%	94.48%	93.61%	0.0000	0.0001
10.5	149,001,551	93.83%	93.82%	92.86%	0.0000	0.0001
11.5	143,134,056	93.21%	93.15%	92.11%	0.0000	0.0001
12.5	136,757,297	92.55%	92.46%	91.36%	0.0000	0.0001
13.5	132,619,998	91.66%	91.77%	90.60%	0.0000	0.0001
14.5	125,055,124	90.76%	91.05%	89.83%	0.0000	0.0001
15.5	117,783,408	90.10%	90.33%	89.06%	0.0000	0.0001
16.5	111,286,588	89.12%	89.59%	88.28%	0.0000	0.0001
17.5	104,379,550	88.44%	88.83%	87.49%	0.0000	0.0001
18.5	99,926,545	87.67%	88.07%	86.70%	0.0000	0.0001
19.5	93,452,071	86.87%	87.28%	85.91%	0.0000	0.0001
20.5	85,424,861	86.02%	86.48%	85.11%	0.0000	0.0001
21.5	76,880,016	84.86%	85.67%	84.30%	0.0001	0.0000
22.5	69,486,735	83.62%	84.83%	83.48%	0.0001	0.0000
23.5	65,212,080	82.13%	83.98%	82.66%	0.0003	0.0000
24.5	61,801,098	80.80%	83.11%	81.83%	0.0005	0.0001
25.5	58,509,094	79.82%	82.22%	81.00%	0.0006	0.0001
26.5	54,986,976	79.12%	81.30%	80.16%	0.0005	0.0001
27.5	45,992,254	78.53%	80.37%	79.30%	0.0003	0.0001
28.5	44,145,384	77.90%	79.41%	78.44%	0.0002	0.0000
29.5	39,068,080	77.27%	78.44%	77.58%	0.0001	0.0000
30.5	35,235,285	76.64%	77.43%	76.70%	0.0001	0.0000
31.5	34,063,728	76.17%	76.41%	75.81%	0.0000	0.0000
32.5	32,220,242	75.37%	75.35%	74.92%	0.0000	0.0000
33.5	31,715,467	74.84%	74.28%	74.01%	0.0000	0.0001
34.5	29,990,549	74.20%	73.18%	73.10%	0.0001	0.0001
35.5	27,353,130	73.48%	72.05%	72.17%	0.0002	0.0002
36.5	24,295,167	72.94%	70.89%	71.24%	0.0004	0.0003
37.5	21,155,093	72.10%	69.72%	70.29%	0.0006	0.0003
38.5	16,740,898	71.43%	68.51%	69.34%	0.0009	0.0004
39.5	15,393,732	70.70%	67.28%	68.37%	0.0012	0.0005
40.5	14,165,977	69.73%	66.02%	67.39%	0.0014	0.0005
41.5	11,950,312	69.03%	64.74%	66.41%	0.0018	0.0007
42.5	9,290,855	68.53%	63.43%	65.41%	0.0026	0.0010
43.5	8,283,431	67.71%	62.10%	64.40%	0.0031	0.0011
44.5	7,012,509	66.50%	60.74%	63.38%	0.0033	0.0010
45.5	6,153,518	65.75%	59.36%	62.35%	0.0041	0.0012
46.5	5,367,275	65.21%	57.96%	61.31%	0.0053	0.0015
47.5	4,819,268	64.69%	56.54%	60.25%	0.0066	0.0020
48.5	4,374,822	63.54%	55.09%	59.19%	0.0071	0.0019
49.5	3,880,631	62.22%	53.63%	58.12%	0.0074	0.0017

Account 368 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] SPPC R1-50	[5] NNUC R0.5-55	[6] SPPC SSD	[7] NNUC SSD
50.5	3,232,844	61.70%	52.15%	57.04%	0.0091	0.0022
51.5	2,676,940	60.70%	50.66%	55.95%	0.0101	0.0023
52.5	2,299,255	59.95%	49.14%	54.85%	0.0117	0.0026
53.5	1,923,796	59.20%	47.62%	53.74%	0.0134	0.0030
54.5	1,614,603	58.84%	46.08%	52.63%	0.0163	0.0039
55.5	1,445,056	58.35%	44.53%	51.50%	0.0191	0.0047
56.5	1,242,063	57.31%	42.98%	50.37%	0.0205	0.0048
57.5	1,059,786	56.07%	41.42%	49.24%	0.0215	0.0047
58.5	877,645	55.13%	39.85%	48.09%	0.0233	0.0050
59.5	755,205	54.62%	38.28%	46.94%	0.0267	0.0059
60.5	656,674	52.96%	36.72%	45.79%	0.0264	0.0051
61.5	529,918	49.24%	35.15%	44.63%	0.0198	0.0021
62.5	440,740	46.49%	33.59%	43.47%	0.0166	0.0009
63.5	376,564	46.01%	32.04%	42.31%	0.0195	0.0014
64.5	315,275	45.14%	30.50%	41.14%	0.0214	0.0016
65.5	254,042	44.64%	28.97%	39.98%	0.0246	0.0022
66.5	190,231	43.72%	27.45%	38.81%	0.0265	0.0024
67.5	150,649	43.23%	25.96%	37.64%	0.0298	0.0031
68.5	126,216	42.01%	24.48%	36.48%	0.0307	0.0031
69.5	113,725	40.63%	23.02%	35.31%	0.0310	0.0028
70.5	102,715	39.00%	21.60%	34.16%	0.0303	0.0023
71.5	95,734	36.82%	20.20%	33.00%	0.0276	0.0015
72.5	86,270	35.04%	18.83%	31.85%	0.0263	0.0010
73.5	81,523	33.93%	17.49%	30.71%	0.0270	0.0010
74.5	37,865	30.50%	16.19%	29.57%	0.0205	0.0001
75.5	33,277	28.16%	14.93%	28.44%	0.0175	0.0000
76.5	24,076	22.46%	13.71%	27.32%	0.0077	0.0024
77.5	5,571	8.90%	12.53%	26.21%	0.0013	0.0300
78.5		6.03%	11.40%	25.11%	0.0029	0.0364
Sum of Squared Differences				[8]	0.6285	0.1550
Up to 1% of Beginning Exposures				[9]	0.0584	0.0189

[1] Age in years using half-year convention
[2] Dollars exposed to retirement at the beginning of each age interval
[3] Observed life table based on the Company's property records. These numbers form the original survivor curve.
[4] The Company's selected Iowa curve to be fitted to the OLT.
[5] My selected Iowa curve to be fitted to the OLT.
[6] = ([4] - [3])^2. This is the squared difference between each point on the Company's curve and the observed survivor curve.
[7] = ([5] - [3])^2. This is the squared difference between each point on my curve and the observed survivor curve.
[8] = Sum of squared differences. The smallest SSD represents the best mathematical fit.
[9] = Sum of squared differences up to the 1% of beginning exposures cut-off.
*The bold horizontal line represents the 1% of beginning exposures cut-off.

Account 369 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] SPPC R2-65	[5] NNUC R1-82	[6] SPPC SSD	[7] NNUC SSD
0.0	158,216,470	100.00%	100.00%	100.00%	0.0000	0.0000
0.5	152,660,154	99.84%	99.93%	99.84%	0.0000	0.0000
1.5	145,685,168	99.68%	99.78%	99.52%	0.0000	0.0000
2.5	140,500,727	99.51%	99.62%	99.20%	0.0000	0.0000
3.5	130,866,938	99.33%	99.45%	98.87%	0.0000	0.0000
4.5	127,376,002	99.16%	99.27%	98.54%	0.0000	0.0000
5.5	124,689,908	98.99%	99.09%	98.20%	0.0000	0.0001
6.5	117,178,357	98.76%	98.89%	97.85%	0.0000	0.0001
7.5	111,999,101	98.55%	98.69%	97.50%	0.0000	0.0001
8.5	106,670,474	98.30%	98.47%	97.15%	0.0000	0.0001
9.5	102,580,460	98.04%	98.25%	96.79%	0.0000	0.0002
10.5	97,743,914	97.79%	98.01%	96.42%	0.0000	0.0002
11.5	91,429,964	96.47%	97.77%	96.05%	0.0002	0.0000
12.5	86,181,097	96.21%	97.51%	95.67%	0.0002	0.0000
13.5	82,195,819	96.09%	97.24%	95.29%	0.0001	0.0001
14.5	80,754,274	95.25%	96.95%	94.90%	0.0003	0.0000
15.5	73,338,677	95.05%	96.66%	94.51%	0.0003	0.0000
16.5	68,904,562	94.96%	96.35%	94.11%	0.0002	0.0001
17.5	63,879,433	94.86%	96.02%	93.71%	0.0001	0.0001
18.5	59,029,935	94.79%	95.68%	93.30%	0.0001	0.0002
19.5	53,435,542	94.66%	95.33%	92.88%	0.0000	0.0003
20.5	49,514,503	94.49%	94.96%	92.46%	0.0000	0.0004
21.5	44,140,157	94.20%	94.58%	92.04%	0.0000	0.0005
22.5	39,251,546	93.93%	94.17%	91.61%	0.0000	0.0005
23.5	36,307,167	93.65%	93.75%	91.18%	0.0000	0.0006
24.5	33,477,555	93.08%	93.32%	90.74%	0.0000	0.0005
25.5	31,728,307	91.48%	92.86%	90.29%	0.0002	0.0001
26.5	29,522,523	90.99%	92.39%	89.84%	0.0002	0.0001
27.5	25,834,356	90.67%	91.90%	89.39%	0.0002	0.0002
28.5	23,216,514	90.33%	91.39%	88.93%	0.0001	0.0002
29.5	21,039,503	90.04%	90.85%	88.46%	0.0001	0.0002
30.5	19,046,216	89.77%	90.30%	87.99%	0.0000	0.0003
31.5	16,750,262	89.40%	89.72%	87.51%	0.0000	0.0004
32.5	15,522,125	88.93%	89.13%	87.03%	0.0000	0.0004
33.5	14,041,574	88.59%	88.50%	86.54%	0.0000	0.0004
34.5	12,906,581	88.24%	87.86%	86.05%	0.0000	0.0005
35.5	11,670,195	88.00%	87.19%	85.55%	0.0001	0.0006
36.5	10,366,284	87.55%	86.50%	85.04%	0.0001	0.0006
37.5	9,251,328	87.19%	85.78%	84.52%	0.0002	0.0007
38.5	8,278,526	86.94%	85.03%	84.00%	0.0004	0.0009
39.5	7,494,411	86.54%	84.26%	83.47%	0.0005	0.0009
40.5	6,895,377	86.31%	83.45%	82.94%	0.0008	0.0011
41.5	6,163,206	85.96%	82.62%	82.39%	0.0011	0.0013
42.5	5,481,653	85.54%	81.77%	81.84%	0.0014	0.0014
43.5	4,729,169	85.35%	80.88%	81.28%	0.0020	0.0017
44.5	4,104,899	85.06%	79.96%	80.71%	0.0026	0.0019
45.5	3,595,801	84.75%	79.01%	80.14%	0.0033	0.0021
46.5	3,147,798	84.23%	78.03%	79.56%	0.0038	0.0022
47.5	2,844,551	84.12%	77.02%	78.96%	0.0050	0.0027
48.5	2,614,952	83.88%	75.97%	78.36%	0.0063	0.0030
49.5	2,293,489	81.12%	74.89%	77.75%	0.0039	0.0011

Account 369 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] SPPC R2-65	[5] NNUC R1-82	[6] SPPC SSD	[7] NNUC SSD
50.5	2,079,437	77.31%	73.78%	77.13%	0.0012	0.0000
51.5	1,831,132	77.11%	72.64%	76.51%	0.0020	0.0000
52.5	1,630,381	77.04%	71.46%	75.87%	0.0031	0.0001
53.5	1,374,040	74.50%	70.25%	75.22%	0.0018	0.0001
54.5	1,176,044	74.41%	69.01%	74.57%	0.0029	0.0000
55.5	1,075,569	74.35%	67.73%	73.90%	0.0044	0.0000
56.5	881,865	74.28%	66.42%	73.23%	0.0062	0.0001
57.5	762,037	74.25%	65.07%	72.55%	0.0084	0.0003
58.5	674,251	74.24%	63.70%	71.85%	0.0111	0.0006
59.5	602,786	74.09%	62.29%	71.15%	0.0139	0.0009
60.5	525,652	74.05%	60.85%	70.44%	0.0174	0.0013
61.5	454,378	73.93%	59.38%	69.72%	0.0212	0.0018
62.5	407,402	73.68%	57.88%	68.98%	0.0249	0.0022
63.5	367,372	73.66%	56.36%	68.24%	0.0299	0.0029
64.5	320,771	73.62%	54.81%	67.49%	0.0354	0.0038
65.5	268,840	73.52%	53.23%	66.73%	0.0412	0.0046
66.5	234,879	73.51%	51.64%	65.96%	0.0478	0.0057
67.5	206,032	73.49%	50.02%	65.18%	0.0551	0.0069
68.5	178,582	73.48%	48.38%	64.39%	0.0630	0.0083
69.5	161,071	73.48%	46.73%	63.59%	0.0715	0.0098
70.5	152,278	73.21%	45.07%	62.78%	0.0792	0.0109
71.5	147,544	73.20%	43.40%	61.97%	0.0888	0.0126
72.5	140,986	73.08%	41.72%	61.14%	0.0984	0.0143
73.5	135,025	73.02%	40.03%	60.31%	0.1088	0.0162
74.5	109,688	72.51%	38.35%	59.46%	0.1167	0.0170
75.5	101,044	72.46%	36.67%	58.61%	0.1281	0.0192
76.5	92,726	72.35%	35.00%	57.75%	0.1395	0.0213
77.5	85,661	72.33%	33.34%	56.89%	0.1520	0.0238
78.5		72.30%	31.69%	56.01%	0.1649	0.0265
Sum of Squared Differences				[8]	1.5729	0.2404
Up to 1% of Beginning Exposures				[9]	0.0402	0.0295

[1] Age in years using half-year convention

[2] Dollars exposed to retirement at the beginning of each age interval

[3] Observed life table based on the Company's property records. These numbers form the original survivor curve.

[4] The Company's selected Iowa curve to be fitted to the OLT.

[5] My selected Iowa curve to be fitted to the OLT.

[6] = ([4] - [3])^2. This is the squared difference between each point on the Company's curve and the observed survivor curve.

[7] = ([5] - [3])^2. This is the squared difference between each point on my curve and the observed survivor curve.

[8] = Sum of squared differences. The smallest SSD represents the best mathematical fit.

[9] = Sum of squared differences up to the 1% of beginning exposures cut-off.

*The bold horizontal line represents the 1% of beginning exposures cut-off.

Account 303 - Software (Intangible) Rate Calculation

[1] Year	[2] Original Cost	[3] Future Accruals	[4] Remaining Life (Years)	[5] Annual Accrual
1988	$ 260,792			
1990	93,131			
1991	89,924			
1992	177,946			
1993	101,841			
1994	230,664			
1995	181,763			
1998	1,320,609			
1999	760,610			
2000	10,448			
2001	3,271,937			
2002	483,645			
2003	411,368			
2004	2,552,888			
2006	1,131,302			
2007	2,875,249			
2008	3,820,216	$ 301,523	7.5	$ 40,203
2009	2,525,356	509,460	8.5	59,936
2011	454,977	203,537	10.5	19,384
2012	496,280	282,962	11.5	24,605
2013	1,801,882	1,248,661	12.5	99,893
2014	2,701,315	2,203,694	13.5	163,237
2015	1,699,206	1,594,867	14.5	109,991
Total	$ 27,453,346	$ 6,344,701		$ 517,250

Survivor Curve:	**SQ-15**	[6]
Net Salvage:	**0.0%**	[7]
Composite Remaining Life	**12.3**	[8]
Accrual Rate	**1.9%**	[9]

[1], [2], [3] From Depreciation Study
[4] Remaining life based on selected Iowa Curve at [6]
[5] = [3] / [4]
[6] Selected Iowa curve
[7] Selected net salvage percent
[8] = Sum of [3] / Sum of [5]
[9] = Sum of [5] / Sum of [2]

Account 303 - Software (Common) Rate Calculation

[1] Year	[2] Original Cost	[3] Future Accruals	[4] Remaining Life (Years)	[5] Annual Accrual
1985	$ 176,108			
1988	160,406			
1989	21,753			
1990	150,975			
1991	573,787			
1992	444,014			
1993	596			
1994	25,548			
1995	300,931			
1996	147,391			
1997	457,304			
1998	524,351			
2000	7,056,370			
2001	14,522,753			
2002	3,403,909			
2003	2,661,822			
2004	698,356			
2005	1,409,470			
2006	268,943			
2007	7,794,410			
2008	6,002,058	$ 463,791	7.5	$ 61,839
2009	12,845,522	2,572,990	8.5	302,705
2010	29,585,672	9,566,018	9.5	1,006,949
2011	4,341,123	1,937,718	10.5	184,545
2012	14,608,889	8,318,208	11.5	723,322
2013	7,778,548	5,386,054	12.5	430,884
2014	21,661,782	17,664,196	13.5	1,308,459
2015	10,238,310	9,608,499	14.5	662,655
Total	$ 147,861,102	$ 55,517,474		$ 4,681,358

Survivor Curve:	**SQ-15**	[6]
Net Salvage:	**0.0%**	[7]
Composite Remaining Life:	**11.9**	[8]
Accrual Rate:	**3.2%**	[9]

[1], [2], [3] From Depreciation Study
[4] Remaining life based on selected Iowa Curve at [6]
[5] = [3] / [4]
[6] Selected Iowa curve
[7] Selected net salvage percent
[8] = Sum of [3] / Sum of [5]
[9] = Sum of [5] / Sum of [2]

SPPC
Electric Division
350.20 Land Rights

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2015
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 92 *Survivor Curve:* R5

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1938	205.00	92.00	2.23	17.69	39.41
1951	14,213.00	92.00	154.49	28.35	4,379.98
1956	1,783.00	92.00	19.38	32.93	638.14
1957	35,143.00	92.00	381.99	33.86	12,935.99
1959	16,336.00	92.00	177.57	35.76	6,350.39
1960	1,820.00	92.00	19.78	36.72	726.43
1961	11,152.00	92.00	121.22	37.68	4,567.81
1963	15,542.00	92.00	168.94	39.62	6,693.52
1964	6,625.00	92.00	72.01	40.60	2,923.49
1966	11,751.00	92.00	127.73	42.56	5,436.21
1968	38,977.00	92.00	423.67	44.53	18,868.03
1971	76,560.00	92.00	832.19	47.51	39,540.20
1972	19,396.00	92.00	210.83	48.51	10,227.18
1973	2,214.00	92.00	24.07	49.51	1,191.39
1976	26.00	92.00	0.28	52.50	14.84
1977	2,000.00	92.00	21.74	53.50	1,163.06
1978	5,744.00	92.00	62.44	54.50	3,402.70
1979	197,738.00	92.00	2,149.36	55.50	119,287.20
1980	2,260,971.00	92.00	24,576.15	56.50	1,388,521.95
1981	442,757.00	92.00	4,812.65	57.50	276,721.09
1982	345,704.00	92.00	3,757.71	58.50	219,820.91
1983	1,000.00	92.00	10.87	59.50	646.73
1984	1,101,302.00	92.00	11,970.86	60.50	724,220.10
1985	37,763.00	92.00	410.47	61.50	25,243.56
1986	703,753.00	92.00	7,649.61	62.50	478,089.62
1987	40,709.00	92.00	442.50	63.50	28,097.87
1988	331,648.00	92.00	3,604.92	64.50	232,512.57

SPPC

Electric Division

350.20 Land Rights

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

Based Upon Broad Group/Remaining Life Procedure and Technique

***Average Service Life:* 92** ***Survivor Curve:* R5**

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1989	84,715.00	92.00	920.83	65.50	60,313.02
1990	139,913.00	92.00	1,520.82	66.50	101,132.17
1991	175,950.00	92.00	1,912.53	67.50	129,093.03
1992	396,300.00	92.00	4,307.67	68.50	295,069.65
1993	210,024.00	92.00	2,282.90	69.50	158,658.65
1994	244,953.00	92.00	2,662.57	70.50	187,707.67
1995	75,014.00	92.00	815.38	71.50	58,298.67
1998	13,694,082.00	92.00	148,851.00	74.50	11,089,189.58
1999	298,444.00	92.00	3,244.01	75.50	244,917.90
2000	216,448.00	92.00	2,352.73	76.50	179,980.66
2001	511,250.00	92.00	5,557.15	77.50	430,671.32
2002	103,710.00	92.00	1,127.30	78.50	88,491.45
2003	104,131.00	92.00	1,131.88	79.50	89,982.55
2004	5,702,997.00	92.00	61,990.05	80.50	4,990,111.46
2005	4,567,039.00	92.00	49,642.49	81.50	4,045,792.88
2006	7,043,129.00	92.00	76,556.92	82.50	6,315,838.24
2007	505,051.00	92.00	5,489.77	83.50	458,387.97
2008	554,396.00	92.00	6,026.14	84.50	509,199.98
2009	4,454,433.00	92.00	48,418.49	85.50	4,139,712.81
2010	3,027,633.00	92.00	32,909.56	86.50	2,846,630.43
2011	263,222.00	92.00	2,861.15	87.50	250,346.81
2012	118,086.00	92.00	1,283.56	88.50	113,593.53
2013	66,187.00	92.00	719.43	89.50	64,388.41
2014	82,060.00	92.00	891.97	90.50	80,722.04
2015	148,112.00	92.00	1,609.94	91.50	147,307.03

SPPC
Electric Division
350.20 Land Rights

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2015
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 92 *Survivor Curve:* R5

Year	Original Cost	Avg. Service Life	Avg. Annual Accrual	Avg. Remaining Life	Future Annual Accruals
(1)	(2)	(3)	(4)	(5)	(6)
Total	48,510,111.00	92.00	527,291.89	77.16	40,687,798.29

Composite Average Remaining Life ... 77.1 Years

SPPC
Electric Division
352.00 Structures and Improvements

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2015
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 66 *Survivor Curve:* R3

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1951	7,726.00	66.00	117.06	14.04	1,643.06
1952	4,312.00	66.00	65.33	14.54	949.69
1953	2,650.00	66.00	40.15	15.05	604.17
1954	4,838.00	66.00	73.30	15.58	1,141.80
1957	14,479.00	66.00	219.38	17.24	3,782.14
1958	1,560.00	66.00	23.64	17.83	421.32
1960	3,681.00	66.00	55.77	19.03	1,061.35
1961	12,397.00	66.00	187.83	19.65	3,690.69
1962	30,044.00	66.00	455.21	20.28	9,233.96
1963	6,051.00	66.00	91.68	20.93	1,918.72
1964	14,325.00	66.00	217.05	21.59	4,685.55
1966	7,012.00	66.00	106.24	22.94	2,436.78
1967	11,713.00	66.00	177.47	23.63	4,193.08
1968	218,514.00	66.00	3,310.82	24.33	80,541.01
1969	6,152.00	66.00	93.21	25.04	2,333.86
1971	34,614.00	66.00	524.45	26.49	13,891.96
1974	91,306.00	66.00	1,383.43	28.73	39,748.52
1975	4,482.00	66.00	67.91	29.50	2,003.24
1976	6,476.00	66.00	98.12	30.27	2,970.34
1977	228,713.00	66.00	3,465.35	31.06	107,619.45
1979	3,281.00	66.00	49.71	32.65	1,622.88
1980	267,405.00	66.00	4,051.59	33.45	135,531.07
1981	11,068.00	66.00	167.70	34.27	5,746.48
1982	207,013.00	66.00	3,136.56	35.09	110,056.05
1983	10,505.00	66.00	159.17	35.92	5,717.12
1984	1,683.00	66.00	25.50	36.76	937.25
1985	266.00	66.00	4.03	37.60	151.54

SPPC
Electric Division
352.00 Structures and Improvements

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2015
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: **66** *Survivor Curve:* **R3**

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1986	24,973.00	66.00	378.38	38.45	14,549.07
1992	16,497.00	66.00	249.95	43.70	10,923.73
1993	3,831.00	66.00	58.05	44.60	2,588.92
1994	20,979.00	66.00	317.86	45.50	14,464.07
1997	49,209.00	66.00	745.59	48.25	35,974.36
1998	5,137,454.00	66.00	77,840.26	49.17	3,827,703.60
1999	163,232.00	66.00	2,473.21	50.11	123,921.03
2002	200,971.00	66.00	3,045.02	52.92	161,156.75
2004	12,089,332.00	66.00	183,171.81	54.83	10,042,474.97
2005	11,456.00	66.00	173.58	55.78	9,682.28
2006	546,739.00	66.00	8,283.93	56.74	470,040.42
2010	338,858.00	66.00	5,134.22	60.61	311,194.07
2013	135,103.00	66.00	2,047.02	63.54	130,072.78
Total	19,950,900.00	66.00	302,286.56	51.94	15,699,379.14

Composite Average Remaining Life ... 51.9 Years

SPPC
Electric Division
353.00 Station Equipment

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2015
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 55 *Survivor Curve: R2.5*

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1937	28,373.00	55.00	515.87	5.83	3,007.34
1938	7,683.00	55.00	139.69	6.06	845.85
1945	1,877.00	55.00	34.13	7.76	264.71
1950	10,974.00	55.00	199.53	9.17	1,828.96
1951	12,813.00	55.00	232.96	9.48	2,208.24
1952	4,500.00	55.00	81.82	9.80	802.13
1954	23,589.00	55.00	428.89	10.49	4,500.62
1955	5,552.00	55.00	100.95	10.86	1,096.20
1956	1,108.00	55.00	20.15	11.24	226.43
1957	65,721.00	55.00	1,194.92	11.64	13,904.01
1958	4,927.00	55.00	89.58	12.05	1,079.13
1959	18,732.00	55.00	340.58	12.47	4,248.26
1960	8,573.00	55.00	155.87	12.92	2,013.37
1961	47,599.00	55.00	865.43	13.38	11,576.01
1962	324,088.00	55.00	5,892.50	13.85	81,616.40
1963	211,922.00	55.00	3,853.12	14.34	55,259.67
1964	453,377.00	55.00	8,243.20	14.85	122,378.13
1965	106,989.00	55.00	1,945.25	15.37	29,895.15
1966	286,992.00	55.00	5,218.03	15.91	82,995.95
1967	174,059.00	55.00	3,164.70	16.46	52,083.53
1968	425,067.00	55.00	7,728.48	17.02	131,569.41
1969	471,790.00	55.00	8,577.98	17.60	150,988.67
1970	7,891.00	55.00	143.47	18.20	2,610.75
1971	591,264.00	55.00	10,750.23	18.80	202,157.48
1972	945,423.00	55.00	17,189.47	19.43	333,918.64
1973	108,531.00	55.00	1,973.29	20.06	39,582.00
1974	936,883.00	55.00	17,034.20	20.70	352,676.68

SPPC

Electric Division

353.00 Station Equipment

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 55 *Survivor Curve: R2.5*

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1975	2,854,313.00	55.00	51,896.49	21.36	1,108,455.08
1976	999,379.00	55.00	18,170.49	22.03	400,258.23
1977	1,802,929.00	55.00	32,780.46	22.71	744,369.80
1978	316,682.00	55.00	5,757.84	23.40	134,722.35
1979	3,303,288.00	55.00	60,059.66	24.10	1,447,356.23
1980	8,575,388.00	55.00	155,915.83	24.81	3,867,833.33
1981	11,914,264.00	55.00	216,622.54	25.53	5,530,028.44
1982	127,454.00	55.00	2,317.34	26.26	60,851.17
1983	2,207,961.00	55.00	40,144.66	27.00	1,083,862.82
1984	2,497,487.00	55.00	45,408.76	27.75	1,259,994.50
1985	5,577,861.00	55.00	101,415.45	28.51	2,890,905.95
1986	2,433,755.00	55.00	44,250.00	29.27	1,295,223.93
1987	1,772,541.00	55.00	32,227.95	30.05	968,330.64
1988	1,703,158.00	55.00	30,966.45	30.83	954,704.53
1989	2,339,421.00	55.00	42,534.84	31.62	1,345,054.29
1990	1,981,084.00	55.00	36,019.64	32.42	1,167,847.11
1991	919,217.00	55.00	16,713.00	33.23	555,354.56
1992	5,366,234.00	55.00	97,567.69	34.05	3,321,710.41
1993	111,832.00	55.00	2,033.30	34.87	70,899.18
1994	3,135,286.00	55.00	57,005.08	35.70	2,035,080.48
1995	193,278.00	55.00	3,514.14	36.54	128,400.18
1996	156,485.00	55.00	2,845.18	37.38	106,362.13
1997	677,090.00	55.00	12,310.70	38.23	470,690.39
1998	38,404,908.00	55.00	698,269.63	39.09	27,297,725.98
1999	1,547,792.00	55.00	28,141.62	39.96	1,124,508.43
2000	785,277.00	55.00	14,277.73	40.83	582,969.33
2001	4,294,669.00	55.00	78,084.73	41.71	3,256,791.63

SPPC

Electric Division

353.00 Station Equipment

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 55 *Survivor Curve:* R2.5

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
2002	2,872,526.00	55.00	52,227.64	42.59	2,224,425.95
2003	3,363,203.00	55.00	61,149.02	43.48	2,658,803.28
2004	21,294,760.00	55.00	387,176.66	44.38	17,181,305.41
2005	7,256,117.00	55.00	131,929.13	45.28	5,973,258.80
2006	4,333,688.00	55.00	78,794.17	46.18	3,638,848.29
2007	17,583,464.00	55.00	319,698.69	47.09	15,055,239.54
2008	11,595,507.00	55.00	210,826.97	48.01	10,121,008.52
2009	9,102,107.00	55.00	165,492.52	48.93	8,096,885.86
2010	9,906,574.00	55.00	180,119.16	49.85	8,978,939.47
2011	1,668,751.00	55.00	30,340.87	50.78	1,540,650.49
2012	16,427,771.00	55.00	298,686.13	51.71	15,445,069.13
2013	9,787,883.00	55.00	177,961.14	52.65	9,368,776.19
2014	18,322,046.00	55.00	333,127.43	53.58	17,850,497.32
2015	17,391,655.00	55.00	316,211.26	54.53	17,242,200.55
Total	262,191,382.00	55.00	4,767,106.28	42.01	200,271,533.62

Composite Average Remaining Life ... 42.0 *Years*

SPPC

Electric Division

354.00 Towers and Fixtures

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 70 *Survivor Curve:* R4

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1948	1,591.00	70.00	22.73	11.48	261.00
1979	4,172,588.00	70.00	59,608.11	34.48	2,055,473.99
1980	12,431,445.00	70.00	177,591.21	35.39	6,284,236.46
1981	11,656,512.00	70.00	166,520.80	36.30	6,044,499.00
1982	42,431.00	70.00	606.15	37.22	22,558.93
1983	127,469.00	70.00	1,820.98	38.14	69,456.64
1985	2,507,177.00	70.00	35,816.64	40.01	1,433,023.50
1986	230,925.00	70.00	3,298.91	40.95	135,104.86
1992	3,562.00	70.00	50.89	46.71	2,376.86
1994	515,304.00	70.00	7,361.45	48.66	358,198.51
1995	6,745.00	70.00	96.36	49.64	4,782.91
1998	43,934,240.00	70.00	627,628.97	52.59	33,004,982.16
1999	2,829,810.00	70.00	40,425.66	53.57	2,165,745.59
2001	76,605.00	70.00	1,094.35	55.55	60,794.05
2003	36,812.00	70.00	525.88	57.54	30,257.62
2004	40,755,291.00	70.00	582,215.63	58.53	34,077,397.45
2005	1,746,344.00	70.00	24,947.65	59.53	1,485,009.82
2007	756,577.00	70.00	10,808.19	61.52	664,881.63
2013	2,313,123.00	70.00	33,044.45	67.50	2,230,592.91
Total	124,144,551.00	70.00	1,773,485.02	50.82	90,129,633.89

Composite Average Remaining Life ... 50.8 Years

SPPC
Electric Division
355.00 Poles and Fixtures

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2015
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 77 *Survivor Curve:* R2

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1923	15,421.00	77.00	200.27	14.83	2,969.13
1938	28,451.00	77.00	369.49	21.06	7,782.90
1939	99.00	77.00	1.29	21.54	27.70
1951	173,025.00	77.00	2,247.07	27.85	62,577.48
1952	43,111.00	77.00	559.88	28.42	15,914.65
1953	49,653.00	77.00	644.84	29.01	18,705.01
1954	219.00	77.00	2.84	29.60	84.18
1956	17,415.00	77.00	226.17	30.80	6,965.55
1957	418,219.00	77.00	5,431.41	31.41	170,592.84
1958	4,504.00	77.00	58.49	32.03	1,873.29
1960	30,419.00	77.00	395.05	33.28	13,149.05
1961	45,584.00	77.00	592.00	33.92	20,081.97
1962	97,921.00	77.00	1,271.70	34.57	43,961.89
1963	25,658.00	77.00	333.22	35.22	11,736.47
1964	315,988.00	77.00	4,103.73	35.88	147,239.50
1965	301,939.00	77.00	3,921.28	36.54	143,297.14
1966	141,177.00	77.00	1,833.46	37.22	68,236.91
1967	638,071.00	77.00	8,286.62	37.89	314,021.18
1968	6,865.00	77.00	89.16	38.58	3,439.47
1969	551,894.00	77.00	7,167.44	39.27	281,469.51
1970	1,327.00	77.00	17.23	39.97	688.78
1971	507,977.00	77.00	6,597.09	40.67	268,294.45
1972	470,423.00	77.00	6,109.38	41.38	252,797.43
1973	19,664.00	77.00	255.38	42.09	10,749.51
1974	465,261.00	77.00	6,042.34	42.81	258,687.76
1975	3,866,765.00	77.00	50,217.66	43.54	2,186,349.34
1976	15,236.00	77.00	197.87	44.27	8,759.94

SPPC
Electric Division
355.00 Poles and Fixtures

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2015
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 77 *Survivor Curve:* R2

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1977	3,348,106.00	77.00	43,481.84	45.01	1,957,032.19
1978	1,215,733.00	77.00	15,788.72	45.75	722,333.65
1979	268,178.00	77.00	3,482.83	46.50	161,950.98
1980	52,867.00	77.00	686.58	47.25	32,443.30
1981	3,930,112.00	77.00	51,040.34	48.01	2,450,526.45
1982	1,466,734.00	77.00	19,048.47	48.77	929,083.99
1983	53,432.00	77.00	693.92	49.55	34,381.27
1984	3,253,424.00	77.00	42,252.20	50.32	2,126,148.37
1985	26,362.00	77.00	342.36	51.10	17,494.48
1986	93,201.00	77.00	1,210.40	51.89	62,802.34
1987	340,817.00	77.00	4,426.19	52.67	233,148.55
1988	1,605,803.00	77.00	20,854.56	53.47	1,115,062.46
1989	404,474.00	77.00	5,252.90	54.27	285,070.63
1990	863,871.00	77.00	11,219.09	55.07	617,868.74
1991	158,626.00	77.00	2,060.08	55.88	115,119.39
1992	659,926.00	77.00	8,570.46	56.69	485,890.33
1993	372,386.00	77.00	4,836.18	57.51	278,145.02
1994	407,622.00	77.00	5,293.78	58.34	308,815.46
1995	689,852.00	77.00	8,959.10	59.16	530,035.59
1996	320,404.00	77.00	4,161.09	59.99	249,642.06
1997	787,265.00	77.00	10,224.21	60.83	621,936.89
1998	12,015,702.00	77.00	156,047.86	61.67	9,623,346.69
1999	2,826,620.00	77.00	36,709.30	62.51	2,294,863.35
2000	571,201.00	77.00	7,418.18	63.36	470,035.93
2001	585,797.00	77.00	7,607.74	64.21	488,528.44
2002	369,877.00	77.00	4,803.59	65.07	312,571.59
2003	20,046.00	77.00	260.34	65.93	17,164.65

SPPC

Electric Division

355.00 Poles and Fixtures

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 77 *Survivor Curve:* R2

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
2004	2,693,697.00	77.00	34,983.03	66.80	2,336,741.38
2005	7,544,272.00	77.00	97,977.42	67.66	6,629,552.72
2006	9,390,358.00	77.00	121,952.53	68.54	8,358,300.99
2007	255,622.00	77.00	3,319.76	69.41	230,434.32
2008	1,030,860.00	77.00	13,387.77	70.29	941,052.23
2009	6,734,570.00	77.00	87,461.83	71.18	6,225,175.45
2010	2,212,271.00	77.00	28,730.75	72.06	2,070,408.58
2011	1,855,853.00	77.00	24,101.95	72.95	1,758,291.74
2012	476,405.00	77.00	6,187.07	73.85	456,885.82
2013	2,156,599.00	77.00	28,007.74	74.74	2,093,394.90
2014	852,100.00	77.00	11,066.22	75.64	837,087.13
2015	2,566,691.00	77.00	33,333.60	76.55	2,551,571.43
Total	82,730,022.00	77.00	1,074,414.38	60.82	65,350,792.48

Composite Average Remaining Life ... 60.8 Years

SPPC
Electric Division
356.00 Overhead Conductors and Devices
Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2015
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 67 *Survivor Curve:* R4

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1923	41,016.00	67.00	612.19	2.05	1,255.87
1938	19,262.00	67.00	287.50	5.97	1,716.50
1939	525.00	67.00	7.84	6.26	49.09
1944	44.00	67.00	0.66	7.94	5.21
1948	23,726.00	67.00	354.13	9.58	3,390.91
1951	52,401.00	67.00	782.12	11.05	8,639.29
1952	35,258.00	67.00	526.25	11.58	6,094.70
1953	855.00	67.00	12.76	12.15	155.01
1956	14,495.00	67.00	216.35	13.96	3,020.88
1957	492,090.00	67.00	7,344.74	14.61	107,299.97
1958	10,041.00	67.00	149.87	15.27	2,287.78
1960	10,940.00	67.00	163.29	16.62	2,713.44
1961	30,368.00	67.00	453.26	17.31	7,846.29
1962	145,194.00	67.00	2,167.11	18.01	39,031.33
1963	13,096.00	67.00	195.47	18.72	3,659.97
1964	472,770.00	67.00	7,056.38	19.45	137,215.46
1966	485,198.00	67.00	7,241.88	20.92	151,530.92
1967	667,439.00	67.00	9,961.94	21.68	215,993.02
1968	7,072.00	67.00	105.55	22.45	2,369.47
1969	734,323.00	67.00	10,960.22	23.23	254,584.46
1970	8,537.00	67.00	127.42	24.02	3,060.22
1971	313,512.00	67.00	4,679.36	24.82	116,138.13
1972	228,617.00	67.00	3,412.25	25.63	87,457.02
1973	837,011.00	67.00	12,492.90	26.45	330,493.35
1974	141,016.00	67.00	2,104.75	27.29	57,432.65
1975	3,090,331.00	67.00	46,125.08	28.13	1,297,600.36
1976	25,348.00	67.00	378.33	28.99	10,966.20

SPPC

Electric Division

356.00 Overhead Conductors and Devices

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: **67** *Survivor Curve:* **R4**

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1977	3,966,753.00	67.00	59,206.22	29.85	1,767,322.39
1978	248,784.00	67.00	3,713.25	30.72	114,081.96
1979	3,791,765.00	67.00	56,594.41	31.61	1,788,733.02
1980	10,240,650.00	67.00	152,847.97	32.50	4,967,065.46
1981	15,135,671.00	67.00	225,909.15	33.40	7,544,694.40
1982	103,486.00	67.00	1,544.59	34.30	52,985.78
1983	149,581.00	67.00	2,232.59	35.22	78,626.63
1984	35,766.00	67.00	533.83	36.14	19,293.49
1985	70,715.00	67.00	1,055.46	37.07	39,125.54
1986	275,030.00	67.00	4,104.99	38.01	156,015.74
1987	110,043.00	67.00	1,642.46	38.95	63,968.35
1988	573,456.00	67.00	8,559.18	39.89	341,467.38
1989	356,935.00	67.00	5,327.47	40.85	217,606.68
1990	951,279.00	67.00	14,198.42	41.80	593,552.23
1991	340,237.00	67.00	5,078.25	42.76	217,170.06
1992	479,713.00	67.00	7,160.01	43.73	313,115.21
1993	969,464.00	67.00	14,469.84	44.70	646,799.10
1994	411,148.00	67.00	6,136.64	45.67	280,279.55
1995	335,352.00	67.00	5,005.33	46.65	233,491.49
1996	224,072.00	67.00	3,344.41	47.63	159,286.81
1997	139,224.00	67.00	2,078.00	48.61	101,008.90
1998	42,535,311.00	67.00	634,865.55	49.59	31,484,652.79
1999	3,635,159.00	67.00	54,256.97	50.58	2,744,209.39
2000	1,488,295.00	67.00	22,213.71	51.57	1,145,468.95
2001	121,939.00	67.00	1,820.01	52.55	95,650.51
2002	48,029.00	67.00	716.86	53.55	38,384.90
2003	44,324.00	67.00	661.56	54.54	36,079.99

SPPC

Electric Division

356.00 Overhead Conductors and Devices

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 67 *Survivor Curve: R4*

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
2004	18,793,624.00	67.00	280,506.34	55.53	15,576,748.18
2005	8,536,288.00	67.00	127,409.32	56.52	7,201,789.40
2006	3,724,206.00	67.00	55,586.05	57.52	3,197,307.54
2007	6,001,696.00	67.00	89,578.99	58.52	5,241,771.55
2008	6,782,657.00	67.00	101,235.31	59.51	6,024,732.59
2009	5,204,244.00	67.00	77,676.53	60.51	4,700,137.32
2010	5,483,853.00	67.00	81,849.86	61.51	5,034,313.24
2011	4,737,843.00	67.00	70,715.21	62.50	4,420,022.33
2012	573,794.00	67.00	8,564.23	63.50	543,853.05
2013	694,022.00	67.00	10,358.70	64.50	668,151.15
2014	49,190.00	67.00	734.19	65.50	48,089.72
2015	848,964.00	67.00	12,671.31	66.50	842,633.27
Total	156,113,047.00	67.00	2,330,082.77	47.89	111,591,693.54

Composite Average Remaining Life ... 47.8 Years

SPPC

Electric Division

357.00 Underground Conduit

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 60 ***Survivor Curve: S4***

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1993	4,920,384.00	60.00	82,006.27	37.50	3,075,313.61
1998	136,441.00	60.00	2,274.01	42.50	96,645.82
2000	106,695.00	60.00	1,778.25	44.50	79,132.18
2001	73.00	60.00	1.22	45.50	55.36
2002	2,061,180.00	60.00	34,352.95	46.50	1,597,415.13
2004	245,201.00	60.00	4,086.68	48.50	198,204.22
2005	37,310.00	60.00	621.83	49.50	30,780.76
2006	9,235.00	60.00	153.92	50.50	7,772.79
2008	21,190.00	60.00	353.17	52.50	18,541.25
2009	672,565.00	60.00	11,209.40	53.50	599,703.91
2010	4,015.00	60.00	66.92	54.50	3,646.96
2012	7,268.00	60.00	121.13	56.50	6,844.03
2013	283,462.00	60.00	4,724.36	57.50	271,651.10
Total	8,505,019.00	60.00	141,750.09	42.23	5,985,707.12

Composite Average Remaining Life ... 42.2 Years

SPPC

Electric Division

358.00 Underground Conductors and Devices

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 50 *Survivor Curve: S3*

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1993	2,382,331.00	50.00	47,646.62	27.79	1,324,081.15
1998	60,522.00	50.00	1,210.44	32.56	39,417.59
2000	740,752.00	50.00	14,815.04	34.53	511,562.28
2001	1,380.00	50.00	27.60	35.52	980.34
2002	7,405,951.00	50.00	148,119.03	36.51	5,408,133.79
2004	246,188.00	50.00	4,923.76	38.50	189,584.82
2006	1,124,034.00	50.00	22,480.68	40.50	910,491.84
2008	20,779.00	50.00	415.58	42.50	17,662.23
2010	29,711.00	50.00	594.22	44.50	26,442.80
2011	483,372.00	50.00	9,667.44	45.50	439,868.57
2012	1,434.00	50.00	28.68	46.50	1,333.62
2013	11,753.00	50.00	235.06	47.50	11,165.35
2014	14,039.00	50.00	280.78	48.50	13,617.83
Total	12,522,246.00	50.00	250,444.94	35.51	8,894,342.21

Composite Average Remaining Life ... 35.5 Years

SPPC
Electric Division
359.00 Roads and Trails

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2015
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: **95** *Survivor Curve:* **R5**

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1952	34,852.00	95.00	366.86	32.09	11,773.38
1957	24,656.00	95.00	259.54	36.78	9,545.13
1960	3,090.00	95.00	32.53	39.66	1,290.12
1961	7,083.00	95.00	74.56	40.63	3,029.63
1964	52,755.00	95.00	555.32	43.57	24,195.16
1966	4,050.00	95.00	42.63	45.54	1,941.56
1967	17,660.00	95.00	185.90	46.53	8,650.17
1968	22,960.00	95.00	241.68	47.52	11,485.92
1969	40,703.00	95.00	428.45	48.52	20,787.69
1972	146.00	95.00	1.54	51.51	79.16
1975	106,055.00	95.00	1,116.37	54.50	60,843.90
1977	37,405.00	95.00	393.74	56.50	22,246.31
1982	31,696.00	95.00	333.64	61.50	20,518.96
2009	63,613.00	95.00	669.61	88.50	59,260.52
Total	446,724.00	95.00	4,702.37	54.37	255,647.60

Composite Average Remaining Life ... 54.3 Years

SPPC
Electric Division
360.20 Land Rights

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2015
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 95 Survivor Curve: R5

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1935	3,689.00	95.00	38.83	17.92	695.68
1937	4,094.00	95.00	43.09	19.39	835.45
1938	3,456.00	95.00	36.38	20.15	732.90
1939	5,586.00	95.00	58.80	20.92	1,230.16
1940	415.00	95.00	4.37	21.72	94.88
1941	5,202.00	95.00	54.76	22.52	1,233.33
1942	361.00	95.00	3.80	23.34	88.69
1943	1,541.00	95.00	16.22	24.17	392.04
1944	790.00	95.00	8.32	25.01	207.97
1945	56.00	95.00	0.59	25.86	15.24
1946	894.00	95.00	9.41	26.72	251.48
1947	67.00	95.00	0.71	27.60	19.46
1948	1,043.00	95.00	10.98	28.48	312.65
1949	2,457.00	95.00	25.86	29.37	759.56
1950	5,199.00	95.00	54.73	30.27	1,656.47
1951	31,251.00	95.00	328.96	31.18	10,255.65
1952	10,408.00	95.00	109.56	32.09	3,515.93
1953	36,573.00	95.00	384.98	33.02	12,710.24
1954	5,435.00	95.00	57.21	33.95	1,942.07
1955	7,238.00	95.00	76.19	34.88	2,657.75
1956	21,780.00	95.00	229.26	35.83	8,213.91
1957	14,961.00	95.00	157.48	36.78	5,791.89
1958	14,528.00	95.00	152.93	37.73	5,770.44
1959	13,910.00	95.00	146.42	38.70	5,666.15
1960	35,946.00	95.00	378.38	39.66	15,007.96
1961	23,819.00	95.00	250.73	40.63	10,188.16
1962	22,429.00	95.00	236.10	41.61	9,823.77

SPPC
Electric Division
360.20 Land Rights

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2015
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 95 *Survivor Curve:* R5

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1963	26,210.00	95.00	275.90	42.59	11,749.83
1964	64,933.00	95.00	683.51	43.57	29,780.39
1965	65,794.00	95.00	692.57	44.55	30,857.44
1966	98,051.00	95.00	1,032.12	45.54	47,005.33
1967	148,397.00	95.00	1,562.08	46.53	72,687.35
1968	149,460.00	95.00	1,573.27	47.52	74,768.53
1969	120,800.00	95.00	1,271.58	48.52	61,694.55
1970	150,711.00	95.00	1,586.44	49.51	78,549.06
1971	348,902.00	95.00	3,672.66	50.51	185,502.76
1972	19,863.00	95.00	209.08	51.51	10,769.16
1973	8,082.00	95.00	85.07	52.50	4,466.73
1974	28,917.00	95.00	304.39	53.50	16,285.65
1975	63,571.00	95.00	669.17	54.50	36,470.77
1976	120,073.00	95.00	1,263.93	55.50	70,149.09
1977	31,649.00	95.00	333.15	56.50	18,822.98
1978	23,643.00	95.00	248.87	57.50	14,310.30
1979	3,902.00	95.00	41.07	58.50	2,402.81
1980	2,120.00	95.00	22.32	59.50	1,327.79
1981	150,725.00	95.00	1,586.58	60.50	95,987.92
1982	209,239.00	95.00	2,202.52	61.50	135,454.52
1983	3,679.00	95.00	38.73	62.50	2,420.39
1984	3,274.00	95.00	34.46	63.50	2,188.41
1985	27,628.00	95.00	290.82	64.50	18,757.93
1987	111,386.00	95.00	1,172.49	66.50	77,970.09
1988	40,033.00	95.00	421.40	67.50	28,444.46
1989	439,942.00	95.00	4,630.98	68.50	317,220.94
1990	460,559.00	95.00	4,848.01	69.50	336,934.86

SPPC
Electric Division
360.20 Land Rights

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2015
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: **95** *Survivor Curve:* **R5**

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1991	164,358.00	95.00	1,730.09	70.50	121,970.80
1992	49,563.00	95.00	521.72	71.50	37,302.64
1993	267,255.00	95.00	2,813.22	72.50	203,957.56
1994	330,539.00	95.00	3,479.37	73.50	255,732.56
1995	204,364.00	95.00	2,151.21	74.50	160,264.26
1996	29,436.00	95.00	309.85	75.50	23,393.85
1997	55,349.00	95.00	582.62	76.50	44,570.48
1999	2,073.00	95.00	21.82	78.50	1,712.95
2000	7,565.00	95.00	79.63	79.50	6,330.71
2001	182,830.00	95.00	1,924.53	80.50	154,924.28
2002	269,552.00	95.00	2,837.40	81.50	231,247.12
2003	718,041.00	95.00	7,558.35	82.50	623,561.61
2004	45,234.00	95.00	476.15	83.50	39,758.29
2005	211,612.00	95.00	2,227.50	84.50	188,223.23
2006	49,331.00	95.00	519.28	85.50	44,397.88
2007	29,089.00	95.00	306.20	86.50	26,486.29
2008	55,150.00	95.00	580.53	87.50	50,796.04
2009	321,933.00	95.00	3,388.78	88.50	299,905.93
2010	128,025.00	95.00	1,347.64	89.50	120,613.00
2011	1,255,273.00	95.00	13,213.44	90.50	1,195,812.51
2013	90,245.00	95.00	949.95	92.50	87,870.12
2014	440,536.00	95.00	4,637.24	93.50	433,580.15
2015	721,950.00	95.00	7,599.50	94.50	718,150.25
Total	8,823,974.00	95.00	92,884.24	74.86	6,953,612.42

Composite Average Remaining Life ... 74.8 Years

SPPC

Electric Division

361.00 Structures and Improvements

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 89 *Survivor Curve:* R2

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1937	15,834.00	89.00	177.91	29.98	5,334.49
1939	52.00	89.00	0.58	31.09	18.16
1940	1,021.00	89.00	11.47	31.65	363.08
1941	329.00	89.00	3.70	32.22	119.10
1946	577.00	89.00	6.48	35.16	227.93
1947	852.00	89.00	9.57	35.76	342.36
1948	2,542.00	89.00	28.56	36.37	1,038.92
1949	7,426.00	89.00	83.44	36.99	3,086.57
1950	2,654.00	89.00	29.82	37.62	1,121.72
1951	3,267.00	89.00	36.71	38.25	1,404.05
1952	10,554.00	89.00	118.58	38.89	4,611.23
1953	2,357.00	89.00	26.48	39.53	1,046.82
1954	8,846.00	89.00	99.39	40.18	3,993.17
1955	9,784.00	89.00	109.93	40.83	4,488.42
1956	2,336.00	89.00	26.25	41.49	1,088.94
1957	5,881.00	89.00	66.08	42.15	2,785.37
1958	6,588.00	89.00	74.02	42.82	3,169.81
1959	9,329.00	89.00	104.82	43.50	4,559.78
1960	8,789.00	89.00	98.75	44.18	4,363.14
1961	1,783.00	89.00	20.03	44.87	898.90
1962	37,167.00	89.00	417.61	45.56	19,026.68
1963	25,741.00	89.00	289.22	46.26	13,379.08
1964	5,705.00	89.00	64.10	46.96	3,010.24
1965	5,406.00	89.00	60.74	47.67	2,895.44
1966	17,520.00	89.00	196.85	48.38	9,523.92
1967	20,476.00	89.00	230.07	49.10	11,296.56
1968	2,534.00	89.00	28.47	49.82	1,418.59

SPPC
Electric Division
361.00 Structures and Improvements
Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2015
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: ***89*** *Survivor Curve:* ***R2***

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1969	32,920.00	89.00	369.89	50.55	18,698.54
1970	42,844.00	89.00	481.39	51.28	24,688.07
1971	22,137.00	89.00	248.73	52.02	12,939.46
1972	188.00	89.00	2.11	52.76	111.46
1973	4,572.00	89.00	51.37	53.51	2,748.90
1974	74,465.00	89.00	836.68	54.26	45,400.55
1975	31,458.00	89.00	353.46	55.02	19,446.83
1976	21,861.00	89.00	245.63	55.78	13,701.74
1977	2,614.00	89.00	29.37	56.55	1,660.85
1978	17,590.00	89.00	197.64	57.32	11,328.30
1979	17,557.00	89.00	197.27	58.09	11,459.79
1983	33,509.00	89.00	376.51	61.23	23,054.22
1984	7,344.00	89.00	82.52	62.03	5,118.56
1985	66,217.00	89.00	744.01	62.83	46,746.67
1986	30,102.00	89.00	338.22	63.63	21,522.84
1987	7,758.00	89.00	87.17	64.44	5,617.39
1988	17,284.00	89.00	194.20	65.26	12,672.67
1989	579.00	89.00	6.51	66.07	429.83
1991	13,597.00	89.00	152.78	67.71	10,345.13
1992	2,623.00	89.00	29.47	68.54	2,020.15
1993	34,483.00	89.00	387.45	69.38	26,879.90
1994	1,603.00	89.00	18.01	70.21	1,264.60
1995	102,872.00	89.00	1,155.86	71.05	82,125.47
1996	50,934.00	89.00	572.29	71.89	41,144.24
1999	80,071.00	89.00	899.67	74.44	66,974.57
2004	163,098.00	89.00	1,832.56	78.76	144,340.25
2006	10,723.00	89.00	120.48	80.51	9,700.67

SPPC

Electric Division

361.00 Structures and Improvements

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: ***89*** *Survivor Curve:* ***R2***

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
2007	983.00	89.00	11.04	81.39	899.00
2009	1,046,227.00	89.00	11,755.35	83.17	977,647.38
2010	1,063,769.00	89.00	11,952.45	84.06	1,004,670.54
2012	522,488.00	89.00	5,870.65	85.84	503,955.68
2013	30,731.00	89.00	345.29	86.74	29,951.11
Total	3,770,551.00	89.00	42,365.70	77.51	3,283,877.84

Composite Average Remaining Life ... 77.5 Years

SPPC
Electric Division
362.00 Station Equipment

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2015
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 73 *Survivor Curve:* R2.5

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1919	18,832.00	73.00	257.97	9.55	2,462.37
1930	2,400.00	73.00	32.88	12.61	414.67
1937	109,185.00	73.00	1,495.68	15.10	22,585.28
1938	25,465.00	73.00	348.83	15.50	5,407.07
1939	651.00	73.00	8.92	15.91	141.89
1940	13,404.00	73.00	183.62	16.33	2,999.34
1941	39,640.00	73.00	543.01	16.77	9,106.00
1942	11,484.00	73.00	157.31	17.22	2,708.22
1943	5,167.00	73.00	70.78	17.68	1,251.10
1944	2,479.00	73.00	33.96	18.15	616.21
1945	877.00	73.00	12.01	18.63	223.78
1946	59,564.00	73.00	815.94	19.12	15,604.23
1947	32,396.00	73.00	443.78	19.63	8,711.18
1948	220,359.00	73.00	3,018.61	20.15	60,822.20
1949	147,807.00	73.00	2,024.75	20.68	41,868.02
1950	52,602.00	73.00	720.57	21.22	15,288.84
1951	51,286.00	73.00	702.55	21.77	15,295.66
1952	95,241.00	73.00	1,304.67	22.33	29,138.37
1953	86,679.00	73.00	1,187.38	22.91	27,198.06
1954	134,681.00	73.00	1,844.94	23.49	43,342.97
1955	249,552.00	73.00	3,418.51	24.09	82,339.55
1956	125,356.00	73.00	1,717.20	24.69	42,396.04
1957	56,138.00	73.00	769.01	25.31	19,461.16
1958	184,930.00	73.00	2,533.28	25.93	65,686.74
1959	237,529.00	73.00	3,253.82	26.56	86,437.40
1960	287,861.00	73.00	3,943.29	27.21	107,285.03
1961	256,874.00	73.00	3,518.82	27.86	98,023.85

SPPC
Electric Division
362.00 Station Equipment

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2015
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 73 *Survivor Curve: R2.5*

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1962	799,873.00	73.00	10,957.14	28.52	312,495.39
1963	345,686.00	73.00	4,735.42	29.19	138,216.48
1964	489,440.00	73.00	6,704.64	29.86	200,223.34
1965	178,145.00	73.00	2,440.34	30.55	74,556.00
1966	599,463.00	73.00	8,211.81	31.24	256,568.17
1967	353,080.00	73.00	4,836.70	31.95	154,516.12
1968	430,328.00	73.00	5,894.89	32.65	192,497.44
1969	780,197.00	73.00	10,687.61	33.37	356,645.95
1970	734,257.00	73.00	10,058.30	34.10	342,944.18
1971	356,224.00	73.00	4,879.77	34.83	169,942.42
1972	228,048.00	73.00	3,123.94	35.56	111,095.11
1973	488,195.00	73.00	6,687.59	36.31	242,824.48
1974	1,054,441.00	73.00	14,444.37	37.06	535,318.49
1975	1,358,866.00	73.00	18,614.57	37.82	704,012.37
1976	1,451,621.00	73.00	19,885.18	38.59	767,277.66
1977	828,510.00	73.00	11,349.43	39.36	446,669.88
1978	1,540,681.00	73.00	21,105.18	40.14	847,074.66
1979	1,021,256.00	73.00	13,989.78	40.92	572,460.40
1980	2,260,534.00	73.00	30,966.16	41.71	1,291,584.21
1981	4,241,766.00	73.00	58,106.27	42.51	2,469,995.91
1982	2,655,480.00	73.00	36,376.37	43.31	1,575,480.97
1983	585,489.00	73.00	8,020.38	44.12	353,845.23
1984	1,427,269.00	73.00	19,551.59	44.94	878,552.11
1985	536,286.00	73.00	7,346.37	45.75	336,131.85
1986	2,886,766.00	73.00	39,544.66	46.58	1,842,079.30
1987	2,136,054.00	73.00	29,260.96	47.41	1,387,369.64
1988	8,356,715.00	73.00	114,475.33	48.25	5,523,440.74

SPPC
Electric Division
362.00 Station Equipment

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2015
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 73 *Survivor Curve:* R2.5

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1989	6,623,316.00	73.00	90,730.18	49.09	4,454,315.26
1990	4,799,103.00	73.00	65,741.01	49.94	3,283,203.76
1991	5,502,205.00	73.00	75,372.52	50.79	3,828,439.34
1992	3,569,867.00	73.00	48,902.19	51.65	2,525,957.29
1993	1,194,154.00	73.00	16,358.24	52.52	859,064.53
1994	11,900,209.00	73.00	163,016.24	53.38	8,702,534.44
1995	2,522,735.00	73.00	34,557.95	54.26	1,875,004.60
1996	1,099,883.00	73.00	15,066.86	55.13	830,686.75
1997	3,310,677.00	73.00	45,351.65	56.02	2,540,423.84
1998	10,132,024.00	73.00	138,794.58	56.90	7,897,672.49
1999	2,091,697.00	73.00	28,653.33	57.79	1,655,918.87
2000	5,150,356.00	73.00	70,552.68	58.69	4,140,539.33
2001	17,542,703.00	73.00	240,310.53	59.59	14,318,982.73
2002	4,495,336.00	73.00	61,579.83	60.49	3,724,867.42
2003	5,340,729.00	73.00	73,160.53	61.39	4,491,660.71
2004	1,474,843.00	73.00	20,203.29	62.30	1,258,747.77
2005	4,648,174.00	73.00	63,673.49	63.22	4,025,337.19
2006	3,706,179.00	73.00	50,769.48	64.14	3,256,112.20
2007	3,566,000.00	73.00	48,849.22	65.06	3,177,892.10
2008	8,827,528.00	73.00	120,924.81	65.98	7,978,571.54
2009	9,965,451.00	73.00	136,512.76	66.91	9,133,538.57
2010	6,657,146.00	73.00	91,193.60	67.84	6,186,156.40
2011	3,445,241.00	73.00	47,194.99	68.77	3,245,555.88
2012	2,856,479.00	73.00	39,129.77	69.70	2,727,514.98
2013	2,507,111.00	73.00	34,343.92	70.64	2,426,163.06
2014	4,875,054.00	73.00	66,781.43	71.58	4,780,480.75
2015	13,829,976.00	73.00	189,451.36	72.53	13,740,360.44

SPPC

Electric Division

362.00 Station Equipment

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 73 *Survivor Curve:* R2.5

Year	Original Cost	Avg. Service Life	Avg. Annual Accrual	Avg. Remaining Life	Future Annual Accruals
(1)	(2)	(3)	(4)	(5)	(6)
Total	192,267,285.00	73.00	2,633,793.30	56.94	149,956,335.96

Composite Average Remaining Life ... 56.9 *Years*

SPPC
Electric Division
364.00 Poles, Towers, and Fixtures
Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2015
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: ***68*** *Survivor Curve:* ***R1***

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1914	19,928.00	68.00	293.05	11.22	3,287.10
1926	16,621.00	68.00	244.42	15.61	3,814.40
1927	7,536.00	68.00	110.82	16.00	1,772.69
1935	13,592.00	68.00	199.88	19.27	3,852.33
1937	15,512.00	68.00	228.11	20.14	4,593.37
1938	7,152.00	68.00	105.17	20.57	2,163.92
1940	688.00	68.00	10.12	21.46	217.17
1941	5,795.00	68.00	85.22	21.92	1,867.72
1942	99.00	68.00	1.46	22.37	32.57
1943	9,403.00	68.00	138.28	22.84	3,157.59
1944	1,126.00	68.00	16.56	23.30	385.85
1945	986.00	68.00	14.50	23.77	344.70
1946	10,912.00	68.00	160.47	24.25	3,891.30
1948	49,872.00	68.00	733.40	25.22	18,494.10
1949	26,982.00	68.00	396.79	25.71	10,200.43
1950	8,208.00	68.00	120.70	26.20	3,162.94
1951	152,016.00	68.00	2,235.49	26.70	59,698.39
1952	81,515.00	68.00	1,198.73	27.21	32,619.23
1953	174,296.00	68.00	2,563.13	27.72	71,056.11
1954	85,395.00	68.00	1,255.79	28.24	35,462.43
1955	72,309.00	68.00	1,063.35	28.76	30,582.30
1956	256,570.00	68.00	3,773.02	29.29	110,502.00
1957	147,790.00	68.00	2,173.34	29.82	64,806.69
1958	136,205.00	68.00	2,002.98	30.35	60,800.19
1959	223,816.00	68.00	3,291.35	30.90	101,696.32
1960	276,878.00	68.00	4,071.66	31.44	128,030.79
1961	357,618.00	68.00	5,258.99	32.00	168,275.78

SPPC

Electric Division

364.00 Poles, Towers, and Fixtures

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

Based Upon Broad Group/Remaining Life Procedure and Technique

***Average Service Life:* 68 *Survivor Curve:* R1**

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1962	561,328.00	68.00	8,254.67	32.55	268,725.52
1963	486,782.00	68.00	7,158.42	33.12	237,071.75
1964	483,780.00	68.00	7,114.28	33.68	239,642.52
1965	610,527.00	68.00	8,978.17	34.26	307,576.46
1966	362,423.00	68.00	5,329.65	34.84	185,659.70
1967	370,978.00	68.00	5,455.46	35.42	193,224.89
1968	480,621.00	68.00	7,067.82	36.01	254,481.21
1969	1,123,467.00	68.00	16,521.26	36.60	604,656.27
1970	476,514.00	68.00	7,007.43	37.20	260,643.92
1971	706,592.00	68.00	10,390.86	37.80	392,752.75
1972	863,034.00	68.00	12,691.44	38.40	487,403.07
1973	753,562.00	68.00	11,081.58	39.01	432,339.13
1974	3,554,339.00	68.00	52,268.70	39.63	2,071,469.73
1975	1,882,385.00	68.00	27,681.61	40.25	1,114,192.62
1976	1,812,872.00	68.00	26,659.38	40.88	1,089,724.90
1977	1,868,342.00	68.00	27,475.10	41.50	1,140,315.91
1978	1,544,234.00	68.00	22,708.89	42.14	956,893.18
1979	1,282,761.00	68.00	18,863.77	42.77	806,866.83
1980	3,163,860.00	68.00	46,526.47	43.41	2,019,939.93
1981	3,129,622.00	68.00	46,022.98	44.06	2,027,706.39
1982	2,507,872.00	68.00	36,879.77	44.71	1,648,796.09
1983	1,400,697.00	68.00	20,598.09	45.36	934,294.00
1984	2,051,325.00	68.00	30,165.97	46.01	1,388,051.23
1985	1,955,866.00	68.00	28,762.19	46.67	1,342,373.48
1986	4,443,463.00	68.00	65,343.80	47.33	3,092,933.75
1987	3,343,998.00	68.00	49,175.51	48.00	2,360,280.50
1988	6,253,438.00	68.00	91,960.58	48.66	4,475,222.84

SPPC

Electric Division

364.00 Poles, Towers, and Fixtures

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 68 Survivor Curve: R1

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1989	9,485,365.00	68.00	139,488.02	49.33	6,881,513.81
1990	4,272,610.00	68.00	62,831.31	50.01	3,141,994.95
1991	3,444,042.00	68.00	50,646.72	50.68	2,566,853.01
1992	4,899,575.00	68.00	72,051.21	51.36	3,700,417.90
1993	3,191,037.00	68.00	46,926.12	52.04	2,441,969.39
1994	4,494,564.00	68.00	66,095.28	52.72	3,484,534.01
1995	1,904,165.00	68.00	28,001.90	53.40	1,495,430.96
1996	2,786,683.00	68.00	40,979.86	54.09	2,216,614.26
1997	3,227,511.00	68.00	47,462.50	54.78	2,599,967.18
1998	3,956,736.00	68.00	58,186.19	55.47	3,227,564.45
1999	6,545,922.00	68.00	96,261.73	56.16	5,406,365.91
2000	5,787,726.00	68.00	85,112.00	56.86	4,839,313.76
2001	3,275,243.00	68.00	48,164.42	57.56	2,772,182.01
2002	1,922,988.00	68.00	28,278.70	58.26	1,647,424.43
2003	3,122,569.00	68.00	45,919.26	58.96	2,707,415.44
2004	302,705.00	68.00	4,451.46	59.67	265,600.20
2005	1,613,169.00	68.00	23,722.62	60.37	1,432,251.68
2006	1,134,419.00	68.00	16,682.32	61.09	1,019,058.52
2007	3,385,989.00	68.00	49,793.01	61.80	3,077,198.27
2008	7,703,049.00	68.00	113,277.98	62.52	7,081,933.64
2009	3,027,750.00	68.00	44,524.89	63.24	2,815,662.90
2010	3,332,384.00	68.00	49,004.72	63.96	3,134,462.32
2011	1,886,178.00	68.00	27,737.39	64.69	1,794,292.64
2012	281,920.00	68.00	4,145.80	65.42	271,216.46
2013	8,348,177.00	68.00	122,764.98	66.15	8,121,183.54
2014	6,007,552.00	68.00	88,344.68	66.89	5,909,359.14
2015	18,123,160.00	68.00	266,512.00	67.63	18,024,059.91

SPPC

Electric Division

364.00 Poles, Towers, and Fixtures

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: **68** *Survivor Curve:* **R1**

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
Total	167,096,690.00	68.00	2,457,257.65	54.26	133,333,847.66

Composite Average Remaining Life ... 54.2 Years

SPPC
Electric Division
365.00 Overhead Conductors and Devices
Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2015
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 55 *Survivor Curve:* R3

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1937	86,488.00	55.00	1,572.51	3.56	5,601.86
1938	5,142.00	55.00	93.49	3.81	356.66
1939	218.00	55.00	3.96	4.07	16.13
1940	21,773.00	55.00	395.87	4.33	1,712.44
1941	207.00	55.00	3.76	4.58	17.25
1942	346.00	55.00	6.29	4.85	30.51
1943	1,020.00	55.00	18.55	5.11	94.68
1944	1,444.00	55.00	26.25	5.37	140.87
1945	750.00	55.00	13.64	5.63	76.78
1946	19,768.00	55.00	359.42	5.90	2,121.23
1947	25.00	55.00	0.45	6.19	2.81
1948	40,742.00	55.00	740.76	6.47	4,791.01
1949	8,706.00	55.00	158.29	6.76	1,070.06
1950	12,302.00	55.00	223.67	7.06	1,579.90
1951	114,623.00	55.00	2,084.05	7.38	15,377.44
1952	37,136.00	55.00	675.20	7.71	5,203.39
1953	138,337.00	55.00	2,515.22	8.05	20,244.58
1954	9,219.00	55.00	167.62	8.40	1,408.53
1955	11,750.00	55.00	213.64	8.77	1,874.22
1956	86,169.00	55.00	1,566.71	9.16	14,348.69
1957	200,331.00	55.00	3,642.38	9.56	34,822.13
1958	44,841.00	55.00	815.29	9.98	8,134.61
1959	76,028.00	55.00	1,382.33	10.41	14,394.05
1960	45,300.00	55.00	823.64	10.87	8,949.26
1961	288,457.00	55.00	5,244.67	11.34	59,450.95
1962	875,084.00	55.00	15,910.61	11.82	188,106.63
1963	611,699.00	55.00	11,121.80	12.33	137,099.74

SPPC

Electric Division

365.00 Overhead Conductors and Devices

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 55 *Survivor Curve:* R3

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1964	121,971.00	55.00	2,217.65	12.85	28,489.21
1965	285,201.00	55.00	5,185.47	13.39	69,412.54
1966	343,436.00	55.00	6,244.29	13.94	87,057.73
1967	518,861.00	55.00	9,433.83	14.51	136,924.91
1968	515,819.00	55.00	9,378.52	15.10	141,638.01
1969	1,701,475.00	55.00	30,935.90	15.70	485,792.97
1970	584,288.00	55.00	10,623.41	16.32	173,407.80
1971	795,376.00	55.00	14,461.38	16.96	245,230.78
1972	838,307.00	55.00	15,241.94	17.61	268,351.84
1973	496,484.00	55.00	9,026.98	18.27	164,907.08
1974	3,408,992.00	55.00	61,981.65	18.94	1,174,148.76
1975	1,509,504.00	55.00	27,445.52	19.63	538,740.07
1976	2,657,865.00	55.00	48,324.80	20.33	982,482.91
1977	2,564,791.00	55.00	46,632.55	21.04	981,334.83
1978	1,787,343.00	55.00	32,497.14	21.77	707,416.71
1979	1,271,942.00	55.00	23,126.21	22.50	520,438.79
1980	2,817,264.00	55.00	51,222.97	23.25	1,190,861.57
1981	1,661,387.00	55.00	30,207.03	24.01	725,168.11
1982	5,125,668.00	55.00	93,193.93	24.77	2,308,859.03
1983	1,187,704.00	55.00	21,594.61	25.55	551,804.80
1984	593,156.00	55.00	10,784.65	26.34	284,075.68
1985	1,782,841.00	55.00	32,415.28	27.14	879,690.17
1986	4,207,902.00	55.00	76,507.29	27.94	2,137,874.63
1987	4,830,781.00	55.00	87,832.35	28.76	2,526,073.65
1988	6,447,838.00	55.00	117,233.38	29.59	3,468,453.63
1989	7,328,173.00	55.00	133,239.47	30.42	4,053,196.70
1990	4,336,913.00	55.00	78,852.94	31.26	2,465,220.69

SPPC
Electric Division
365.00 Overhead Conductors and Devices
Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2015
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 55 *Survivor Curve:* R3

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1991	3,346,443.00	55.00	60,844.40	32.11	1,953,928.04
1992	3,782,257.00	55.00	68,768.29	32.97	2,267,573.82
1993	2,330,288.00	55.00	42,368.86	33.84	1,433,878.88
1994	2,516,340.00	55.00	45,751.62	34.72	1,588,461.04
1995	1,001,868.00	55.00	18,215.78	35.60	648,542.50
1996	1,094,277.00	55.00	19,895.94	36.49	726,100.03
1997	1,921,009.00	55.00	34,927.43	37.39	1,306,028.13
1998	1,761,896.00	55.00	32,034.46	38.30	1,226,884.82
1999	287,399.00	55.00	5,225.43	39.21	204,898.95
2000	2,164,760.00	55.00	39,359.26	40.13	1,579,534.15
2001	1,330,044.00	55.00	24,182.61	41.06	992,858.07
2002	746,409.00	55.00	13,571.07	41.99	569,809.84
2003	3,051,298.00	55.00	55,478.13	42.92	2,381,373.73
2004	2,397,263.00	55.00	43,586.59	43.87	1,912,024.67
2005	256,712.00	55.00	4,667.49	44.81	209,173.48
2006	684,937.00	55.00	12,453.40	45.77	569,959.86
2007	4,402,613.00	55.00	80,047.48	46.72	3,740,162.69
2008	6,693,136.00	55.00	121,693.34	47.68	5,802,925.83
2009	5,011,521.00	55.00	91,118.54	48.65	4,432,922.16
2010	2,805,715.00	55.00	51,012.98	49.62	2,531,206.06
2011	2,068,603.00	55.00	37,610.95	50.59	1,902,774.81
2012	5,234,295.00	55.00	95,168.97	51.57	4,907,498.59
2013	7,841,354.00	55.00	142,570.03	52.54	7,491,164.27
2014	2,546,662.00	55.00	46,302.93	53.52	2,478,343.05
2015	5,007,505.00	55.00	91,045.52	54.51	4,962,677.64

SPPC

Electric Division

365.00 Overhead Conductors and Devices

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 55 *Survivor Curve:* R3

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
Total	132,743,791.00	55.00	2,413,522.72	35.49	85,644,785.13

Composite Average Remaining Life ... 35.4 Years

SPPC

Electric Division

366.00 Underground Conduit

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 78 *Survivor Curve:* R4

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1947	11,318.00	78.00	145.10	16.75	2,430.38
1949	41,529.00	78.00	532.42	18.07	9,620.10
1950	11,791.00	78.00	151.17	18.74	2,833.10
1951	634.00	78.00	8.13	19.42	157.87
1952	218.00	78.00	2.79	20.12	56.23
1956	31,223.00	78.00	400.29	22.97	9,196.20
1957	98,526.00	78.00	1,263.15	23.71	29,949.27
1958	23,013.00	78.00	295.04	24.46	7,215.23
1959	20,199.00	78.00	258.96	25.21	6,529.60
1960	9,278.00	78.00	118.95	25.98	3,090.32
1961	89,857.00	78.00	1,152.01	26.76	30,822.22
1962	2,978.00	78.00	38.18	27.54	1,051.42
1963	131,867.00	78.00	1,690.59	28.34	47,907.94
1964	39,379.00	78.00	504.86	29.14	14,712.54
1965	185,119.00	78.00	2,373.30	29.96	71,092.39
1966	144,934.00	78.00	1,858.12	30.78	57,194.56
1967	69,898.00	78.00	896.12	31.61	28,329.36
1968	286,806.00	78.00	3,676.98	32.45	119,332.60
1969	491,746.00	78.00	6,304.39	33.30	209,955.28
1970	550,194.00	78.00	7,053.72	34.16	240,988.43
1971	492,345.00	78.00	6,312.07	35.03	221,120.73
1972	1,237,961.00	78.00	15,871.19	35.91	569,865.62
1973	392,476.00	78.00	5,031.71	36.79	185,118.91
1974	841,891.00	78.00	10,793.40	37.68	406,704.01
1975	605,591.00	78.00	7,763.93	38.58	299,516.75
1976	513,387.00	78.00	6,581.84	39.48	259,862.31
1977	614,830.00	78.00	7,882.38	40.40	318,409.32

SPPC

Electric Division

366.00 Underground Conduit

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 78 *Survivor Curve:* R4

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1978	1,094,790.00	78.00	14,035.67	41.31	579,848.37
1979	627,312.00	78.00	8,042.41	42.24	339,676.03
1980	1,703,302.00	78.00	21,837.06	43.16	942,580.87
1981	1,626,855.00	78.00	20,856.97	44.10	919,819.74
1982	1,161,119.00	78.00	14,886.04	45.04	670,483.92
1983	1,650,019.00	78.00	21,153.95	45.99	972,776.47
1984	1,145,933.00	78.00	14,691.35	46.94	689,560.28
1985	1,121,959.00	78.00	14,383.99	47.89	688,853.35
1986	2,873,495.00	78.00	36,839.43	48.85	1,799,529.08
1987	2,822,067.00	78.00	36,180.10	49.81	1,802,100.50
1988	2,535,003.00	78.00	32,499.82	50.78	1,650,199.10
1989	3,453,809.00	78.00	44,279.30	51.74	2,291,188.36
1990	2,307,564.00	78.00	29,583.95	52.72	1,559,525.12
1991	3,431,528.00	78.00	43,993.65	53.69	2,362,032.72
1992	3,192,253.00	78.00	40,926.04	54.67	2,237,311.50
1993	2,135,864.00	78.00	27,382.69	55.65	1,523,745.46
1994	3,542,033.00	78.00	45,410.37	56.63	2,571,477.22
1995	2,573,943.00	78.00	32,999.05	57.61	1,901,129.14
1996	2,990,813.00	78.00	38,343.50	58.60	2,246,807.79
1997	4,127,061.00	78.00	52,910.68	59.58	3,152,609.60
1998	4,367,965.00	78.00	55,999.17	60.57	3,392,003.39
1999	4,347,165.00	78.00	55,732.51	61.56	3,431,012.20
2000	287,398.00	78.00	3,684.56	62.55	230,480.77
2001	705,712.00	78.00	9,047.53	63.55	574,925.43
2002	358,165.00	78.00	4,591.83	64.54	296,349.23
2003	696,755.00	78.00	8,932.70	65.53	585,380.29
2004	1,017,970.00	78.00	13,050.81	66.53	868,230.87

SPPC

Electric Division

366.00 Underground Conduit

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

Based Upon Broad Group/Remaining Life Procedure and Technique

***Average Service Life:* 78** ***Survivor Curve:* R4**

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
2005	817,784.00	78.00	10,484.34	67.52	707,929.48
2006	598,923.00	78.00	7,678.45	68.52	526,116.51
2007	1,939,235.00	78.00	24,861.82	69.52	1,728,273.18
2008	957,113.00	78.00	12,270.60	70.51	865,226.45
2009	2,299,793.00	78.00	29,484.33	71.51	2,108,417.72
2010	632,960.00	78.00	8,114.82	72.51	588,386.09
2011	469,540.00	78.00	6,019.70	73.51	442,482.91
2012	2,131,316.00	78.00	27,324.38	74.50	2,035,783.17
2013	1,851,240.00	78.00	23,733.69	75.50	1,791,963.55
2014	963,270.00	78.00	12,349.53	76.50	944,762.05
2015	1,828,077.00	78.00	23,436.73	77.50	1,816,367.38
Total	79,326,091.00	78.00	1,016,994.31	56.04	56,988,407.98

Composite Average Remaining Life ... 56.0 Years

SPPC

Electric Division

367.00 Underground Conductors and Devices

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 75 *Survivor Curve:* S1

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1956	3,583.00	75.00	47.77	31.08	1,485.02
1957	115,926.00	75.00	1,545.68	31.58	48,810.01
1958	33,706.00	75.00	449.41	32.08	14,415.99
1959	2,440.00	75.00	32.53	32.58	1,060.07
1960	14,121.00	75.00	188.28	33.10	6,231.20
1961	514,426.00	75.00	6,859.01	33.61	230,547.64
1962	3,613.00	75.00	48.17	34.14	1,644.53
1963	56,662.00	75.00	755.49	34.67	26,191.38
1964	94,047.00	75.00	1,253.96	35.20	44,144.56
1965	241,450.00	75.00	3,219.33	35.75	115,089.43
1966	188,142.00	75.00	2,508.56	36.30	91,060.00
1967	163,168.00	75.00	2,175.57	36.86	80,183.86
1968	360,284.00	75.00	4,803.79	37.42	179,772.15
1969	405,368.00	75.00	5,404.91	37.99	205,357.92
1970	599,773.00	75.00	7,996.97	38.57	308,469.85
1971	511,832.00	75.00	6,824.43	39.16	267,261.75
1972	1,292,944.00	75.00	17,239.25	39.76	685,383.03
1973	671,373.00	75.00	8,951.64	40.36	361,279.62
1974	1,375,612.00	75.00	18,341.49	40.97	751,492.69
1975	1,062,037.00	75.00	14,160.49	41.59	588,952.07
1976	1,063,370.00	75.00	14,178.27	42.22	598,577.11
1977	1,287,463.00	75.00	17,166.17	42.86	735,685.28
1978	3,380,184.00	75.00	45,069.12	43.50	1,960,572.92
1979	1,817,324.00	75.00	24,230.99	44.15	1,069,907.09
1980	3,737,222.00	75.00	49,829.63	44.82	2,233,377.35
1981	4,551,414.00	75.00	60,685.52	45.49	2,760,730.44
1982	2,221,675.00	75.00	29,622.34	46.17	1,367,759.50

SPPC

Electric Division

367.00 Underground Conductors and Devices

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 75 *Survivor Curve:* S1

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1983	1,725,410.00	75.00	23,005.47	46.87	1,078,209.28
1984	2,026,035.00	75.00	27,013.80	47.57	1,285,006.30
1985	1,842,073.00	75.00	24,560.98	48.28	1,185,771.08
1986	5,718,005.00	75.00	76,240.07	49.00	3,735,982.30
1987	4,417,585.00	75.00	58,901.14	49.73	2,929,396.91
1988	4,625,580.00	75.00	61,674.40	50.47	3,113,014.26
1989	5,323,905.00	75.00	70,985.40	51.23	3,636,612.97
1990	5,425,185.00	75.00	72,335.80	51.99	3,760,973.69
1991	6,189,416.00	75.00	82,525.55	52.77	4,354,547.31
1992	6,463,940.00	75.00	86,185.87	53.55	4,615,585.72
1993	4,225,151.00	75.00	56,335.35	54.35	3,061,787.64
1994	7,017,424.00	75.00	93,565.66	55.16	5,160,615.88
1995	5,727,973.00	75.00	76,372.98	55.98	4,275,053.49
1996	6,495,674.00	75.00	86,608.99	56.80	4,919,807.49
1997	11,943,087.00	75.00	159,241.17	57.64	9,179,299.72
1998	11,396,430.00	75.00	151,952.41	58.50	8,888,989.24
1999	8,192,170.00	75.00	109,228.94	59.36	6,483,926.77
2000	14,413,184.00	75.00	192,175.80	60.23	11,575,446.09
2001	12,201,810.00	75.00	162,690.81	61.12	9,943,877.60
2002	9,002,037.00	75.00	120,027.17	62.02	7,443,697.06
2003	16,535,953.00	75.00	220,479.39	62.92	13,873,058.91
2004	16,840,909.00	75.00	224,545.47	63.84	14,335,411.81
2005	15,910,024.00	75.00	212,133.67	64.77	13,739,666.98
2006	17,119,695.00	75.00	228,262.62	65.71	14,998,049.05
2007	33,047,576.00	75.00	440,634.38	66.65	29,370,201.94
2008	16,290,062.00	75.00	217,200.84	67.61	14,684,949.24
2009	12,590,855.00	75.00	167,878.08	68.57	11,512,025.94

SPPC
Electric Division
367.00 Underground Conductors and Devices
Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2015
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 75 *Survivor Curve:* S1

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
2010	4,609,902.00	75.00	61,465.36	69.55	4,274,795.31
2011	4,402,927.00	75.00	58,705.70	70.53	4,140,364.72
2012	3,996,718.00	75.00	53,289.58	71.51	3,810,898.19
2013	7,011,051.00	75.00	93,480.69	72.51	6,777,882.00
2014	6,216,679.00	75.00	82,889.06	73.50	6,092,453.11
2015	7,544,502.00	75.00	100,593.37	74.50	7,494,186.34
Total	322,258,086.00	75.00	4,296,774.77	60.62	260,466,986.78

Composite Average Remaining Life ... 60.6 *Years*

SPPC

Electric Division

368.00 Line Transformers

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 55 *Survivor Curve:* R0.5

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1937	3,775.00	55.00	68.63	13.50	926.73
1938	3,970.00	55.00	72.18	13.90	1,003.64
1939	2,461.00	55.00	44.74	14.31	640.25
1940	1,668.00	55.00	30.33	14.72	446.28
1941	3,324.00	55.00	60.44	15.12	914.07
1942	975.00	55.00	17.73	15.54	275.42
1943	3,892.00	55.00	70.76	15.95	1,128.72
1944	1,232.00	55.00	22.40	16.37	366.63
1945	6,457.00	55.00	117.40	16.79	1,970.83
1946	8,329.00	55.00	151.43	17.21	2,606.26
1947	20,204.00	55.00	367.34	17.64	6,478.74
1948	37,430.00	55.00	680.53	18.07	12,294.73
1949	58,598.00	55.00	1,065.40	18.50	19,708.97
1950	57,693.00	55.00	1,048.94	18.94	19,862.30
1951	52,932.00	55.00	962.38	19.38	18,646.63
1952	57,942.00	55.00	1,053.47	19.82	20,878.91
1953	57,543.00	55.00	1,046.21	20.27	21,203.11
1954	80,494.00	55.00	1,463.50	20.72	30,320.38
1955	71,578.00	55.00	1,301.39	21.17	27,554.26
1956	111,479.00	55.00	2,026.85	21.63	43,844.90
1957	161,072.00	55.00	2,928.52	22.10	64,706.20
1958	155,498.00	55.00	2,827.18	22.56	63,786.77
1959	177,175.00	55.00	3,221.30	23.03	74,197.29
1960	154,116.00	55.00	2,802.05	23.51	65,873.04
1961	284,116.00	55.00	5,165.64	23.99	123,915.99
1962	312,702.00	55.00	5,685.37	24.47	139,134.34
1963	276,570.00	55.00	5,028.44	24.96	125,511.55

SPPC
Electric Division
368.00 Line Transformers

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2015
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 55 *Survivor Curve:* R0.5

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1964	436,560.00	55.00	7,937.29	25.45	202,020.57
1965	515,978.00	55.00	9,381.22	25.95	243,430.36
1966	363,590.00	55.00	6,610.59	26.45	174,846.58
1967	331,176.00	55.00	6,021.26	26.95	162,299.56
1968	464,986.00	55.00	8,454.11	27.46	232,180.15
1969	600,414.00	55.00	10,916.39	27.98	305,399.35
1970	651,374.00	55.00	11,842.92	28.49	337,450.47
1971	1,010,139.00	55.00	18,365.78	29.02	532,894.09
1972	887,868.00	55.00	16,142.72	29.54	476,877.82
1973	2,538,867.00	55.00	46,160.25	30.07	1,388,089.56
1974	2,074,692.00	55.00	37,720.88	30.60	1,154,438.85
1975	967,502.00	55.00	17,590.58	31.14	547,801.47
1976	1,175,615.00	55.00	21,374.37	31.68	677,211.92
1977	3,350,621.00	55.00	60,919.10	32.23	1,963,342.00
1978	2,827,532.00	55.00	51,408.59	32.78	1,685,050.95
1979	2,852,864.00	55.00	51,869.17	33.33	1,728,803.68
1980	2,342,459.00	55.00	42,589.27	33.89	1,443,150.83
1981	1,452,595.00	55.00	26,410.26	34.44	909,697.41
1983	1,486,914.00	55.00	27,034.23	35.57	961,699.61
1984	951,369.00	55.00	17,297.26	36.14	625,160.84
1985	1,830,819.00	55.00	33,286.92	36.71	1,222,090.86
1986	1,349,038.00	55.00	24,527.45	37.29	914,573.11
1987	1,471,089.00	55.00	26,746.51	37.86	1,012,755.27
1988	8,025,510.00	55.00	145,915.30	38.44	5,609,654.07
1989	3,003,314.00	55.00	54,604.56	39.03	2,131,026.91
1990	1,864,105.00	55.00	33,892.11	39.61	1,342,487.66
1991	1,695,742.00	55.00	30,831.03	40.20	1,239,291.30

SPPC
Electric Division
368.00 Line Transformers
Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2015
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 55 *Survivor Curve: R0.5*

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1992	2,214,382.00	55.00	40,260.65	40.78	1,642,009.11
1993	5,760,036.00	55.00	104,725.73	41.37	4,332,967.89
1994	7,391,745.00	55.00	134,392.54	41.97	5,639,917.14
1995	7,103,724.00	55.00	129,155.91	42.56	5,496,753.94
1996	5,376,795.00	55.00	97,757.86	43.15	4,218,592.77
1997	2,963,588.00	55.00	53,882.29	43.75	2,357,289.39
1998	5,677,958.00	55.00	103,233.43	44.35	4,577,986.41
1999	4,685,358.00	55.00	85,186.54	44.94	3,828,639.39
2000	6,133,658.00	55.00	111,518.72	45.54	5,078,951.46
2001	5,949,449.00	55.00	108,169.53	46.14	4,991,363.95
2002	2,284,514.00	55.00	41,535.75	46.75	1,941,590.74
2003	5,084,829.00	55.00	92,449.50	47.35	4,377,295.55
2004	3,373,322.00	55.00	61,331.84	47.95	2,940,991.41
2005	4,326,700.00	55.00	78,665.62	48.56	3,819,808.76
2006	5,358,366.00	55.00	97,422.79	49.16	4,789,720.04
2007	4,138,605.00	55.00	75,245.79	49.77	3,745,160.36
2008	18,408,009.00	55.00	334,684.05	50.38	16,861,884.85
2009	7,044,542.00	55.00	128,079.90	50.99	6,531,123.51
2010	4,270,195.00	55.00	77,638.28	51.61	4,006,531.72
2011	10,874,649.00	55.00	197,716.74	52.22	10,324,592.71
2012	12,013,780.00	55.00	218,427.78	52.83	11,540,551.44
2013	14,046,656.00	55.00	255,388.39	53.45	13,650,823.92
2014	11,840,619.00	55.00	215,279.47	54.07	11,640,166.41
2015	10,159,658.00	55.00	184,717.18	54.69	10,102,253.36

SPPC

Electric Division

368.00 Line Transformers

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 55 *Survivor Curve:* R0.5

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
Total	215,167,094.00	55.00	3,912,046.92	45.64	178,548,888.39

Composite Average Remaining Life ... 45.6 *Years*

SPPC
Electric Division
369.00 Services

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2015
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 82 *Survivor Curve:* R1

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1937	85,621.00	82.00	1,044.14	31.84	33,245.62
1938	7,038.00	82.00	85.83	32.34	2,775.88
1939	8,171.00	82.00	99.64	32.85	3,273.40
1940	8,570.00	82.00	104.51	33.36	3,486.64
1941	9,165.00	82.00	111.77	33.88	3,786.28
1942	3,177.00	82.00	38.74	34.40	1,332.61
1943	1,218.00	82.00	14.85	34.92	518.70
1944	3,202.00	82.00	39.05	35.45	1,384.22
1945	5,720.00	82.00	69.75	35.98	2,509.86
1946	16,823.00	82.00	205.16	36.52	7,491.71
1947	27,344.00	82.00	333.46	37.06	12,357.16
1948	28,031.00	82.00	341.84	37.60	12,854.56
1949	31,818.00	82.00	388.02	38.15	14,804.33
1950	43,164.00	82.00	526.38	38.71	20,374.68
1951	31,204.00	82.00	380.53	39.26	14,941.32
1952	26,761.00	82.00	326.35	39.83	12,997.80
1953	34,589.00	82.00	421.81	40.39	17,038.71
1954	57,592.00	82.00	702.33	40.96	28,770.63
1955	63,115.00	82.00	769.68	41.54	31,971.70
1956	56,248.00	82.00	685.94	42.12	28,889.77
1957	68,938.00	82.00	840.69	42.70	35,899.07
1958	97,848.00	82.00	1,193.25	43.29	51,654.07
1959	160,255.00	82.00	1,954.30	43.88	85,753.24
1960	68,712.00	82.00	837.94	44.47	37,266.33
1961	155,350.00	82.00	1,894.48	45.07	85,392.36
1962	159,768.00	82.00	1,948.36	45.68	88,995.46
1963	139,760.00	82.00	1,704.36	46.28	78,884.21

SPPC

Electric Division

369.00 Services

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 82 *Survivor Curve:* R1

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1964	206,566.00	82.00	2,519.05	46.89	118,128.38
1965	72,492.00	82.00	884.03	47.51	41,998.42
1966	181,542.00	82.00	2,213.89	48.13	106,548.66
1967	168,720.00	82.00	2,057.53	48.75	100,302.12
1968	233,755.00	82.00	2,850.62	49.37	140,746.10
1969	337,670.00	82.00	4,117.86	50.00	205,901.32
1970	404,407.00	82.00	4,931.71	50.64	249,718.93
1971	527,952.00	82.00	6,438.33	51.27	330,098.28
1972	653,528.00	82.00	7,969.72	51.91	413,702.56
1973	540,942.00	82.00	6,596.74	52.55	346,664.31
1974	562,591.00	82.00	6,860.75	53.20	364,959.77
1975	418,245.00	82.00	5,100.46	53.84	274,632.70
1976	548,390.00	82.00	6,687.57	54.50	364,442.15
1977	691,079.00	82.00	8,427.65	55.15	464,775.85
1978	859,784.00	82.00	10,484.99	55.81	585,115.21
1979	1,025,207.00	82.00	12,502.31	56.46	705,925.61
1980	929,910.00	82.00	11,340.17	57.13	647,827.26
1981	878,806.00	82.00	10,716.96	57.79	619,341.08
1982	1,212,709.00	82.00	14,788.88	58.46	864,513.04
1983	889,167.00	82.00	10,843.32	59.13	641,114.73
1984	1,993,140.00	82.00	24,306.17	59.80	1,453,446.91
1985	1,641,917.00	82.00	20,023.04	60.47	1,210,803.17
1986	1,820,780.00	82.00	22,204.26	61.15	1,357,690.52
1987	2,452,102.00	82.00	29,903.18	61.82	1,848,685.45
1988	3,185,449.00	82.00	38,846.28	62.50	2,427,934.63
1989	1,693,957.00	82.00	20,657.66	63.18	1,305,218.08
1990	958,071.00	82.00	11,683.59	63.87	746,183.85

SPPC
Electric Division
369.00 Services

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2015
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 82 *Survivor Curve:* R1

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1991	2,353,218.00	82.00	28,697.29	64.55	1,852,420.69
1992	2,525,481.00	82.00	30,798.03	65.24	2,009,153.91
1993	4,549,507.00	82.00	55,480.85	65.93	3,657,609.14
1994	4,871,822.00	82.00	59,411.46	66.62	3,957,734.01
1995	3,434,188.00	82.00	41,879.63	67.31	2,818,814.32
1996	4,976,569.00	82.00	60,688.84	68.00	4,126,915.02
1997	4,117,111.00	82.00	50,207.82	68.70	3,449,117.75
1998	4,258,158.00	82.00	51,927.88	69.40	3,603,590.23
1999	3,756,619.00	82.00	45,811.65	70.10	3,211,221.38
2000	6,691,104.00	82.00	81,597.45	70.80	5,776,964.66
2001	275,322.00	82.00	3,357.53	71.50	240,072.10
2002	3,513,184.00	82.00	42,842.98	72.21	3,093,712.72
2003	4,659,055.00	82.00	56,816.78	72.92	4,143,063.13
2004	4,018,804.00	82.00	49,008.98	73.63	3,608,588.18
2005	4,483,543.00	82.00	54,676.43	74.34	4,064,915.03
2006	3,223,028.00	82.00	39,304.55	75.06	2,950,240.55
2007	4,469,781.00	82.00	54,508.60	75.78	4,130,732.45
2008	4,231,878.00	82.00	51,607.39	76.50	3,948,111.17
2009	6,373,579.00	82.00	77,725.26	77.23	6,002,474.03
2010	1,749,541.00	82.00	21,335.50	77.95	1,663,173.62
2011	2,944,427.00	82.00	35,907.04	78.68	2,825,305.34
2012	8,153,849.00	82.00	99,435.50	79.42	7,896,788.28
2013	4,917,366.00	82.00	59,966.86	80.15	4,806,411.60
2014	5,457,257.00	82.00	66,550.79	80.89	5,383,209.60
2015	5,302,100.00	82.00	64,658.66	81.63	5,278,026.87

SPPC
Electric Division
369.00 Services

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2015
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: ***82*** *Survivor Curve:* ***R1***

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
Total	131,794,571.00	82.00	1,607,223.66	70.40	113,153,435.14

Composite Average Remaining Life ... 70.4 Years

SPPC

Electric Division

390.00 Structures and Improvements

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 72 *Survivor Curve:* R2

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1937	986.00	72.00	13.69	17.00	232.81
1938	566.00	72.00	7.86	17.43	136.99
1939	30,617.00	72.00	425.24	17.86	7,595.46
1941	735.00	72.00	10.21	18.76	191.46
1944	533.00	72.00	7.40	20.16	149.22
1948	1,783.00	72.00	24.76	22.14	548.32
1949	1,659.00	72.00	23.04	22.66	522.13
1950	444.00	72.00	6.17	23.18	142.97
1951	102.00	72.00	1.42	23.72	33.60
1952	173.00	72.00	2.40	24.26	58.29
1953	13,466.00	72.00	187.03	24.81	4,640.02
1954	232.00	72.00	3.22	25.37	81.74
1956	321.00	72.00	4.46	26.51	118.17
1958	427.00	72.00	5.93	27.68	164.15
1959	1,164.00	72.00	16.17	28.28	457.14
1960	2,173.00	72.00	30.18	28.88	871.64
1961	12,163.00	72.00	168.93	29.49	4,982.11
1963	507,556.00	72.00	7,049.38	30.74	216,700.00
1964	134,395.00	72.00	1,866.59	31.37	58,561.43
1965	55,611.00	72.00	772.37	32.02	24,729.57
1966	42,885.00	72.00	595.62	32.67	19,456.41
1967	31,920.00	72.00	443.33	33.32	14,773.28
1968	57,469.00	72.00	798.18	33.99	27,126.69
1969	98,035.00	72.00	1,361.59	34.65	47,185.14
1970	130,088.00	72.00	1,806.77	35.33	63,839.06
1971	61,458.00	72.00	853.58	36.02	30,742.38
1972	74,822.00	72.00	1,039.19	36.71	38,145.80

SPPC

Electric Division

390.00 Structures and Improvements

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 72 *Survivor Curve:* R2

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1973	32,169.00	72.00	446.79	37.40	16,711.47
1974	1,135,036.00	72.00	15,764.36	38.11	600,704.67
1975	94,591.00	72.00	1,313.76	38.82	50,995.62
1976	1,261,102.00	72.00	17,515.27	39.53	692,404.86
1977	51,397.00	72.00	713.85	40.25	28,735.51
1978	234,480.00	72.00	3,256.66	40.98	133,465.17
1979	113,697.00	72.00	1,579.12	41.72	65,873.55
1980	167,279.00	72.00	2,323.31	42.46	98,640.65
1981	54,429.00	72.00	755.96	43.20	32,658.98
1982	120,560.00	72.00	1,674.44	43.95	73,596.10
1983	108,021.00	72.00	1,500.29	44.71	67,080.90
1984	18,470,118.00	72.00	256,528.92	45.47	11,665,450.89
1985	72,937.00	72.00	1,013.01	46.24	46,845.84
1986	4,389,796.00	72.00	60,969.27	47.02	2,866,640.09
1987	528,998.00	72.00	7,347.18	47.80	351,167.92
1988	660,709.00	72.00	9,176.50	48.58	445,820.12
1989	1,332,886.00	72.00	18,512.27	49.37	913,993.71
1990	606,348.00	72.00	8,421.48	50.17	422,495.26
1991	887,327.00	72.00	12,323.96	50.97	628,139.15
1992	2,247,480.00	72.00	31,214.94	51.77	1,616,110.91
1993	1,394,970.00	72.00	19,374.55	52.59	1,018,822.38
1994	1,221,896.00	72.00	16,970.75	53.40	906,247.78
1995	323,182.00	72.00	4,488.63	54.22	243,381.62
1996	260,206.00	72.00	3,613.97	55.05	198,937.08
1997	141,456.00	72.00	1,964.66	55.88	109,777.37
1998	262,893.00	72.00	3,651.28	56.71	207,070.40
1999	45,253.00	72.00	628.51	57.55	36,171.15

SPPC
Electric Division
390.00 Structures and Improvements

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2015
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 72 *Survivor Curve:* R2

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
2000	23,731.00	72.00	329.60	58.39	19,246.19
2001	4,077,808.00	72.00	56,636.11	59.24	3,355,279.95
2002	1,868,705.00	72.00	25,954.19	60.09	1,559,708.87
2003	446,189.00	72.00	6,197.06	60.95	377,726.09
2004	2,050,150.00	72.00	28,474.25	61.81	1,760,086.68
2005	459,583.00	72.00	6,383.08	62.68	400,077.89
2006	1,942,556.00	72.00	26,979.89	63.55	1,714,529.62
2007	1,877,972.00	72.00	26,082.89	64.42	1,680,296.54
2008	6,053,006.00	72.00	84,069.37	65.30	5,489,693.54
2009	1,638,541.00	72.00	22,757.47	66.18	1,506,104.92
2010	244,954.00	72.00	3,402.13	67.07	228,164.79
2011	1,711,546.00	72.00	23,771.43	67.96	1,615,390.80
2012	3,827,113.00	72.00	53,154.25	68.85	3,659,532.33
2013	5,757,925.00	72.00	79,971.03	69.74	5,577,519.09
2014	2,557,718.00	72.00	35,523.79	70.64	2,509,539.76
2015	1,319,185.00	72.00	18,321.98	71.55	1,310,877.28
Total	73,337,681.00	72.00	1,018,576.95	55.83	56,863,899.46

Composite Average Remaining Life ... 55.8 Years

SPPC
Electric Division
392.00 Transportation Equipment
Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2015
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 14 *Survivor Curve:* L1

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1954	492.00	0.00	0.00	0.00	0.00
1955	1,243.00	0.00	0.00	0.00	0.00
1964	1,669.00	0.00	0.00	0.00	0.00
1965	6,098.00	0.00	0.00	0.00	0.00
1967	7,503.00	0.00	0.00	0.00	0.00
1968	3,750.00	0.00	0.00	0.00	0.00
1969	4,950.00	0.00	0.00	0.00	0.00
1973	5,040.00	14.00	359.97	0.60	215.82
1974	2,839.00	14.00	202.77	0.70	142.72
1976	4,350.00	14.00	310.69	0.99	307.14
1979	5,212.00	14.00	372.25	1.46	544.60
1980	10,434.00	14.00	745.22	1.63	1,215.29
1981	5,957.00	14.00	425.46	1.80	766.03
1982	52,346.00	14.00	3,738.66	1.98	7,393.93
1983	13,412.00	14.00	957.91	2.16	2,068.13
1984	51,913.00	14.00	3,707.73	2.34	8,693.05
1985	17,957.00	14.00	1,282.53	2.53	3,250.69
1986	113,739.00	14.00	8,123.47	2.73	22,171.19
1987	265,172.00	14.00	18,939.12	2.93	55,469.34
1988	200,340.00	14.00	14,308.69	3.13	44,816.65
1989	191,143.00	14.00	13,651.82	3.34	45,629.05
1990	233,374.00	14.00	16,668.04	3.56	59,308.09
1991	21,828.00	14.00	1,559.00	3.78	5,892.99
1992	211,394.00	14.00	15,098.19	4.01	60,513.97
1993	828,470.00	14.00	59,171.00	4.24	251,044.50
1994	65,846.00	14.00	4,702.85	4.48	21,089.24
1996	802,464.00	14.00	57,313.59	4.99	285,973.83

SPPC

Electric Division

392.00 Transportation Equipment

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 14 *Survivor Curve:* L1

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1997	112,241.00	14.00	8,016.48	5.25	42,125.61
1998	12,103.00	14.00	864.42	5.53	4,779.30
2000	65,918.00	14.00	4,708.00	6.11	28,744.49
2001	697,705.00	14.00	49,831.50	6.41	319,375.93
2002	198,186.00	14.00	14,154.84	6.72	95,171.37
2003	669,886.00	14.00	47,844.61	7.05	337,308.91
2004	492,780.00	14.00	35,195.34	7.39	260,059.75
2005	808,139.00	14.00	57,718.91	7.74	446,811.69
2007	281,553.00	14.00	20,109.08	8.49	170,686.97
2008	8,067.00	14.00	576.16	8.89	5,120.77
2009	81,989.00	14.00	5,855.82	9.33	54,623.96
2014	1,873,193.00	14.00	133,787.22	12.64	1,691,184.66
2015	3,238,914.00	14.00	231,329.76	13.53	3,130,804.64
Total	11,669,609.00	11.55	831,631.07	8.97	7,463,304.32

Composite Average Remaining Life ... 8.97 Years

SPPC

Electric Division

396.00 Power Operated Equipment

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: **18** *Survivor Curve:* **L2**

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
2000	17,956.00	18.00	997.56	7.63	7,615.61
2001	1,789,613.00	18.00	99,423.03	7.91	786,437.81
2002	87,468.00	18.00	4,859.34	8.21	39,918.74
2003	835,491.00	18.00	46,416.21	8.56	397,333.63
2009	23,540.00	18.00	1,307.78	12.04	15,743.35
2013	8,558.00	18.00	475.44	15.55	7,391.22
2015	664,221.00	18.00	36,901.20	17.50	645,785.01
Total	3,426,847.00	18.00	190,380.55	9.98	1,900,225.36

Composite Average Remaining Life ... 9.98 Years

SPPC

Electric Division

396.00 Power Operated Equipment

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2015

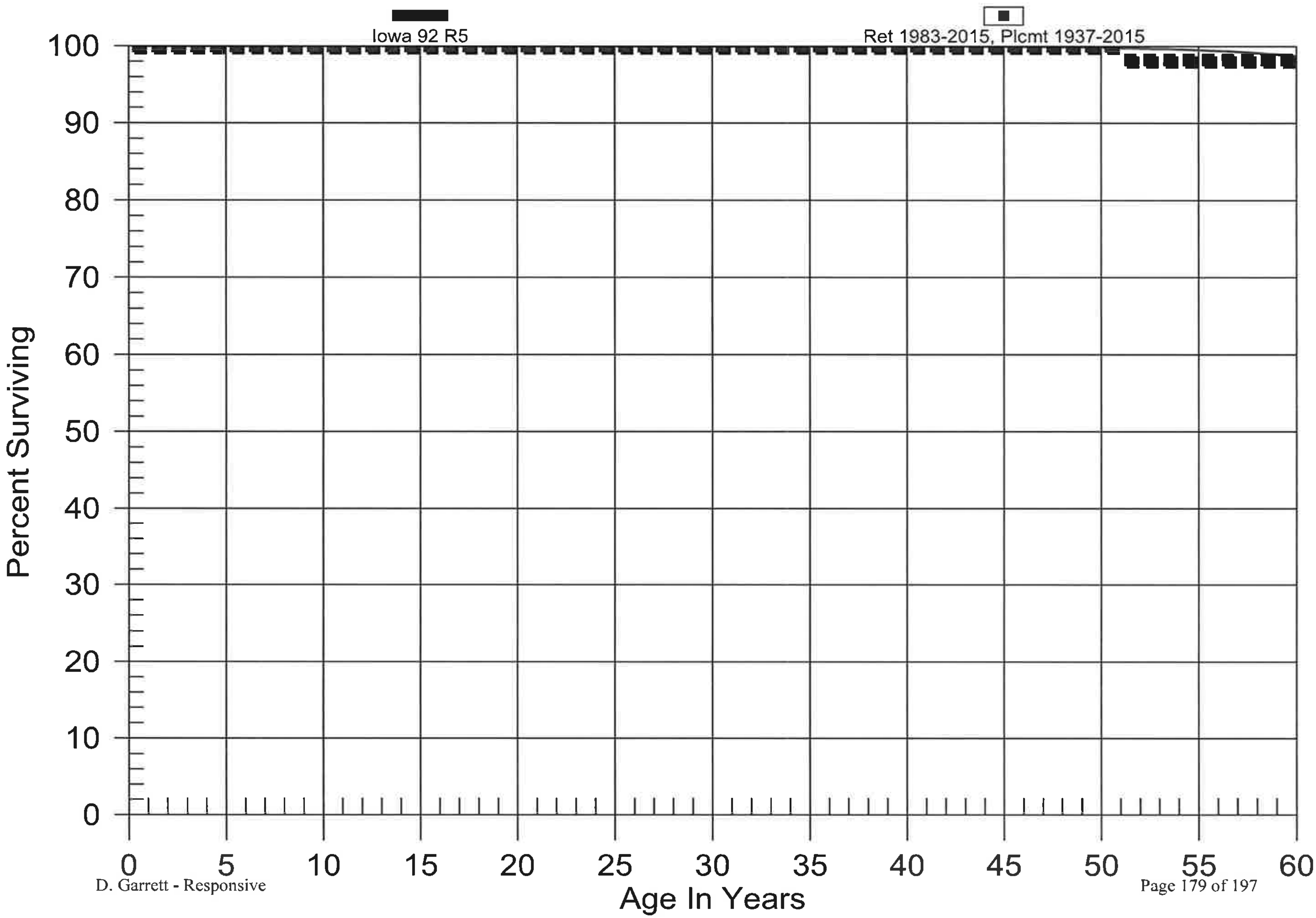
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 18 *Survivor Curve: L2*

Year	Original Cost	Avg. Service Life	Avg. Annual Accrual	Avg. Remaining Life	Future Annual Accruals
(1)	(2)	(3)	(4)	(5)	(6)

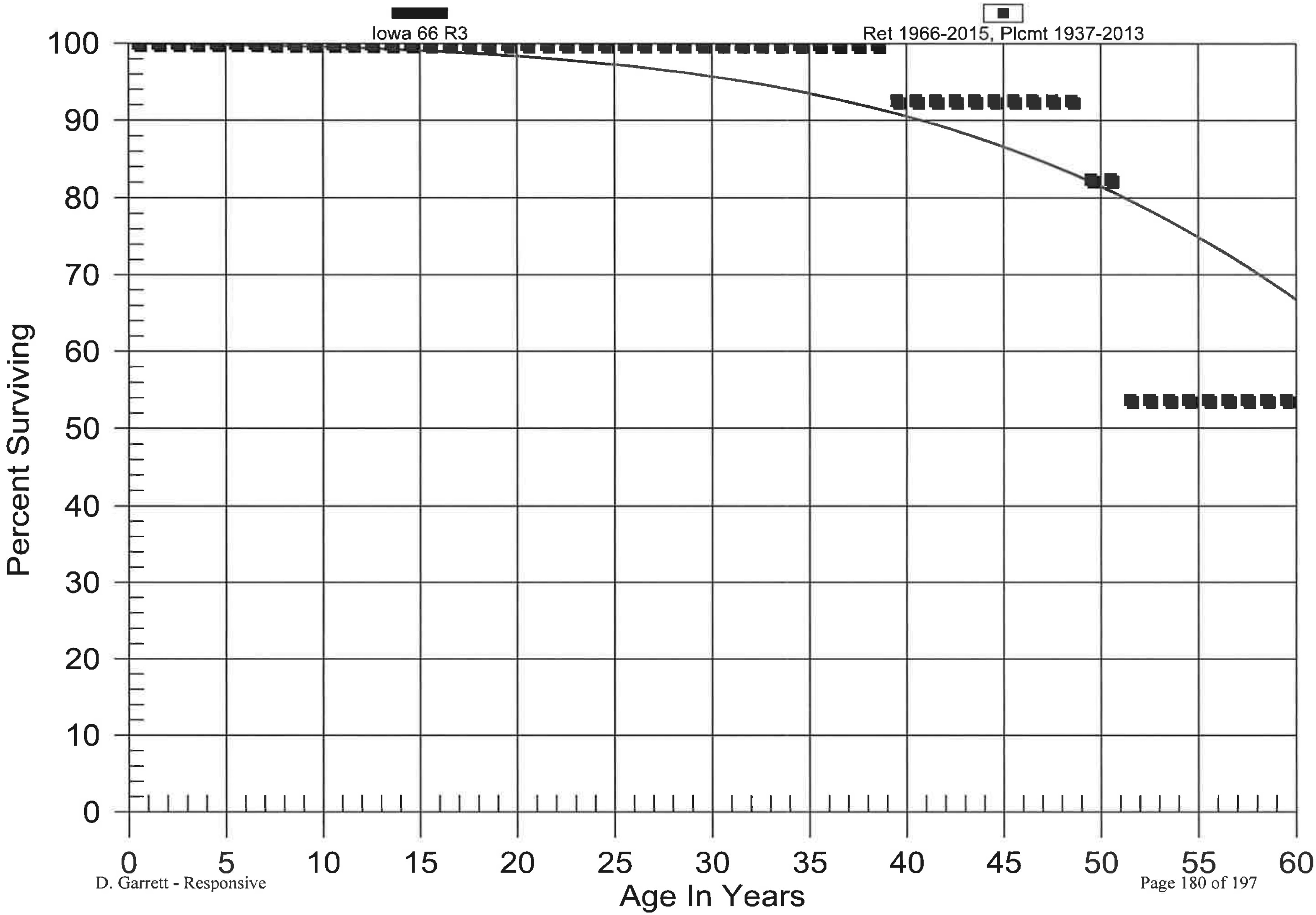
SPPC

Electric Division
350.20 Land Rights
Original And Smooth Survivor Curves



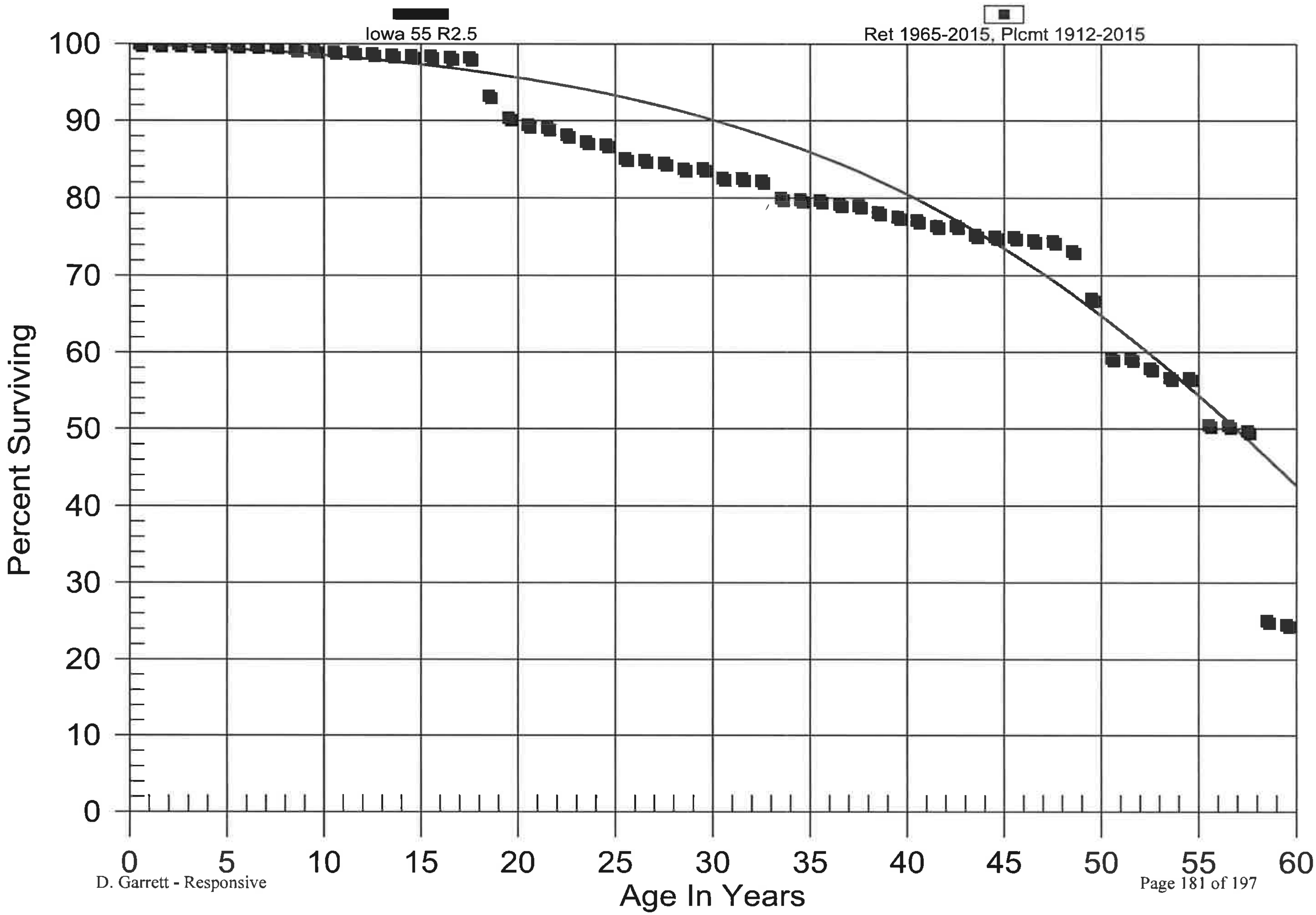
SPPC

Electric Division
352.00 Structures and Improvements
Original And Smooth Survivor Curves



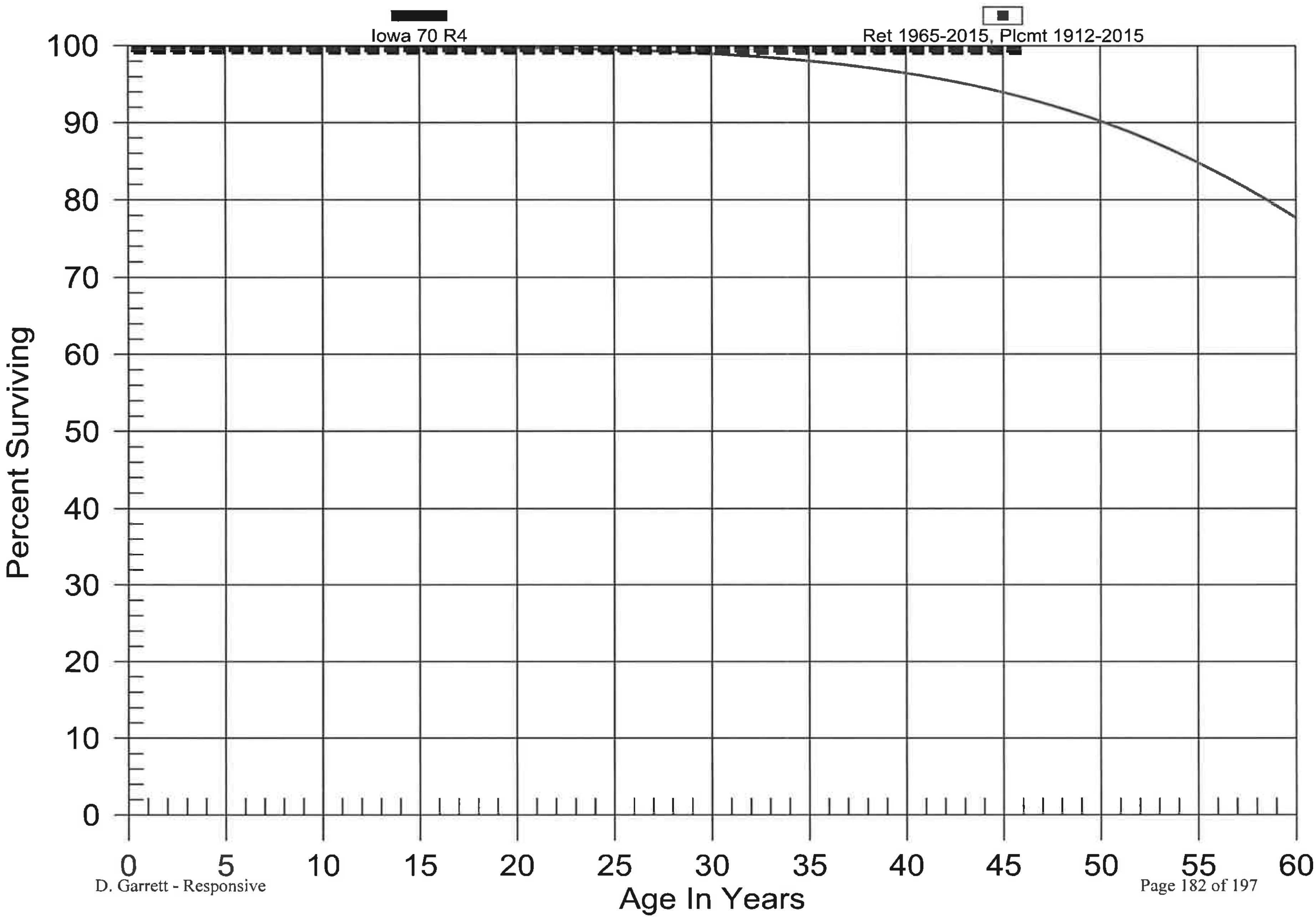
SPPC

Electric Division
353.00 Station Equipment
Original And Smooth Survivor Curves



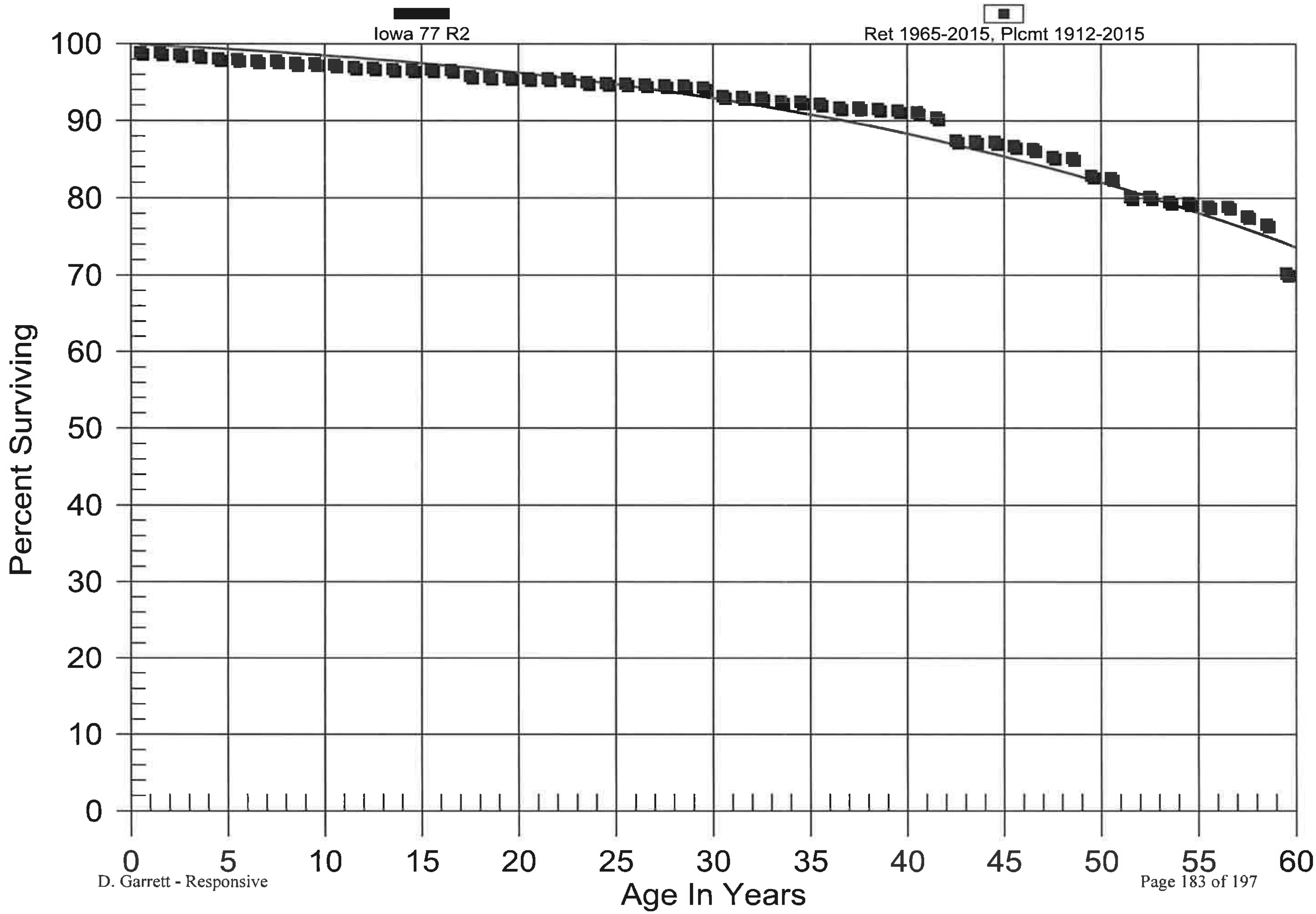
SPPC

Electric Division
354.00 Towers and Fixtures
Original And Smooth Survivor Curves



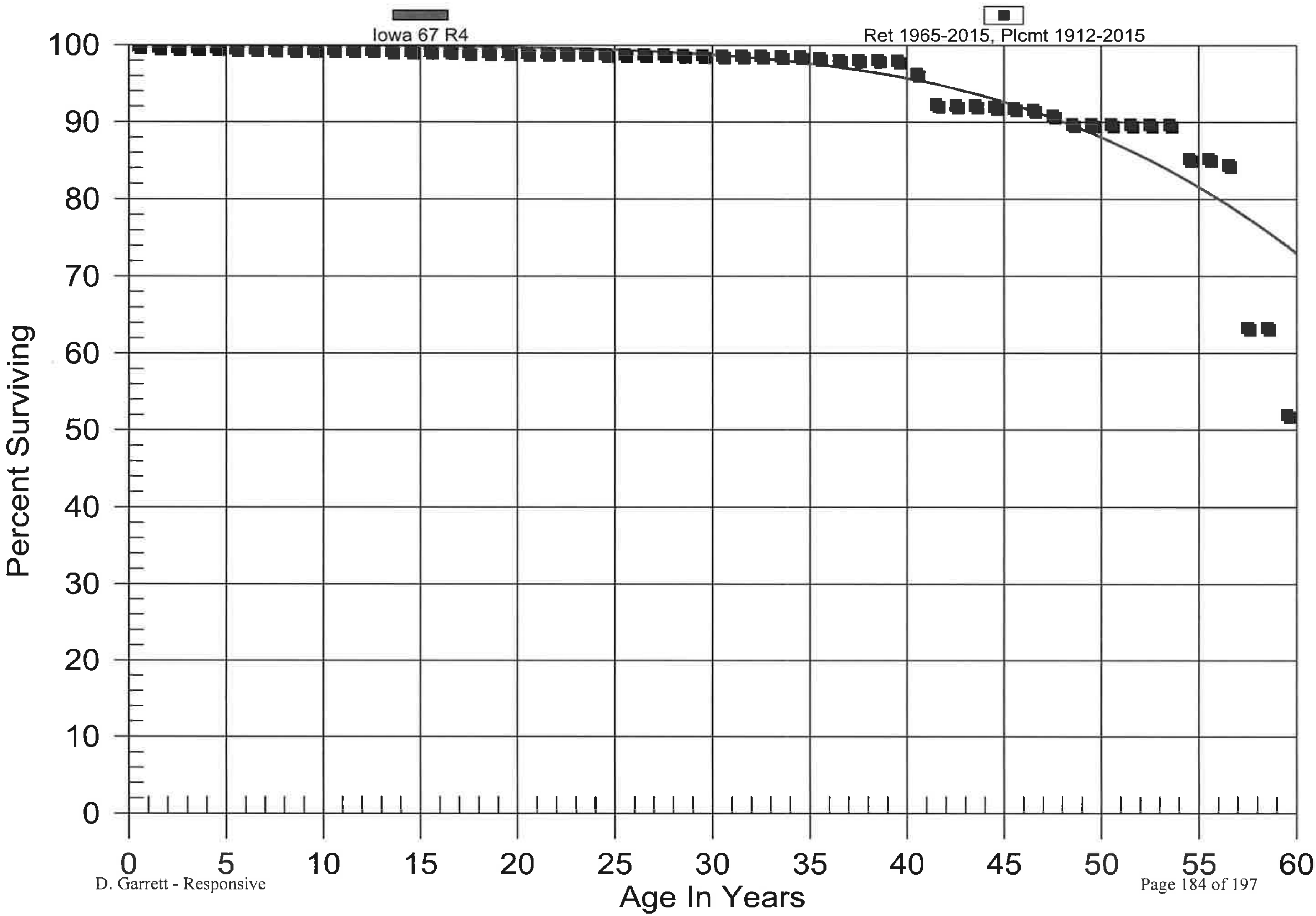
SPPC

Electric Division
355.00 Poles and Fixtures
Original And Smooth Survivor Curves



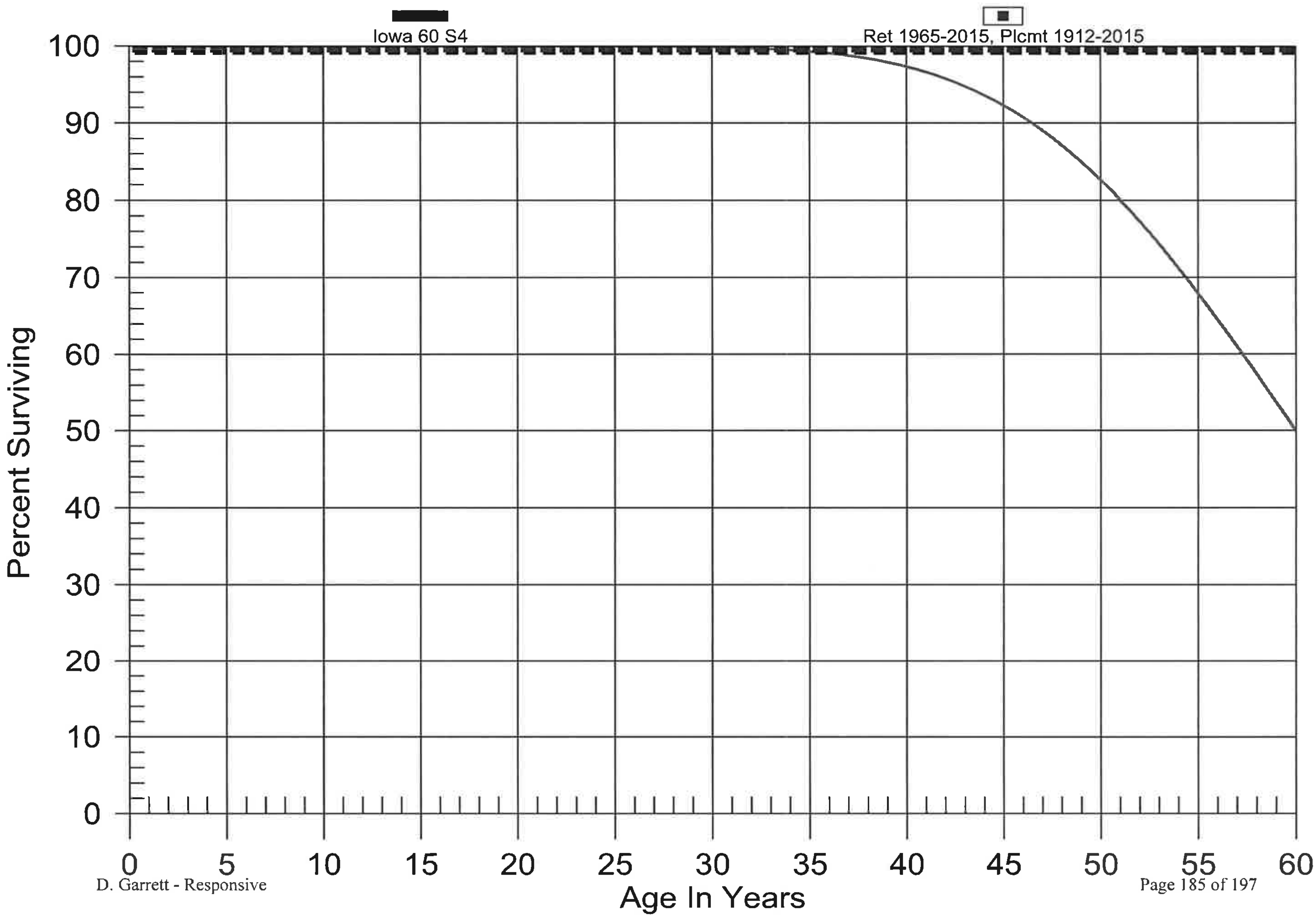
SPPC

Electric Division
356.00 Overhead Conductors and Devices
Original And Smooth Survivor Curves



SPPC

Electric Division
357.00 Underground Conduit
Original And Smooth Survivor Curves



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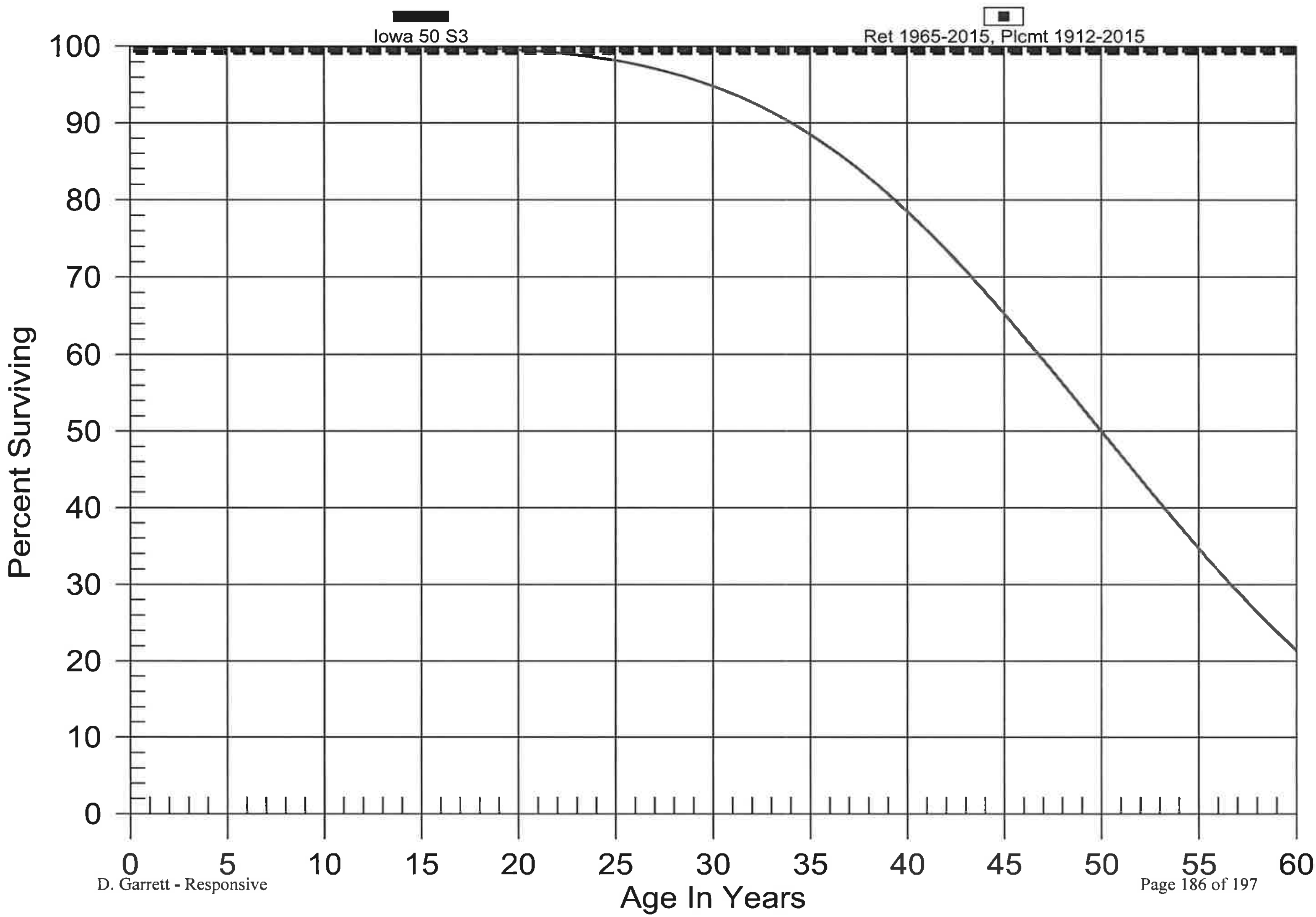
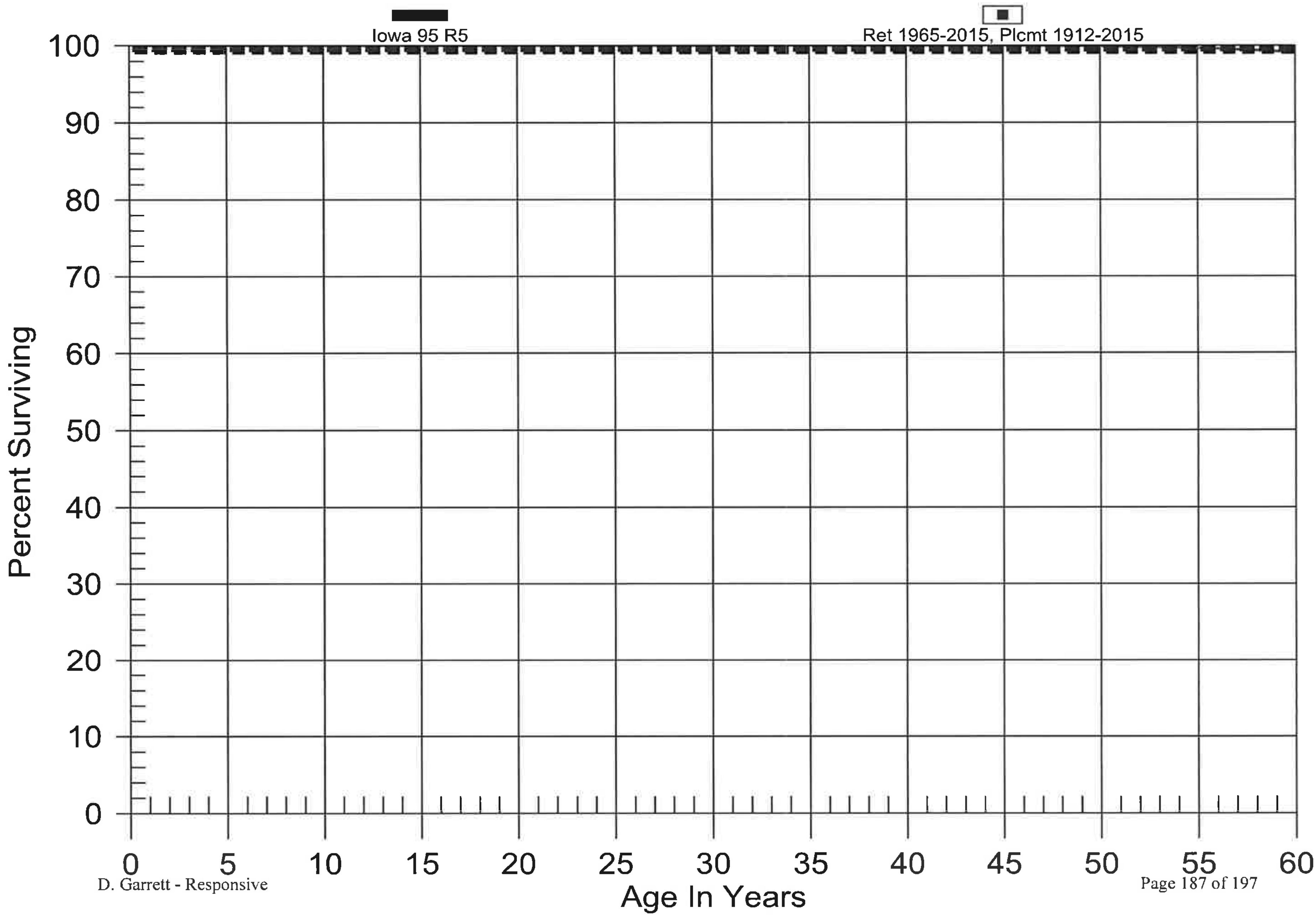
Electric Division
358.00 Underground Conductors and Devices
Original And Smooth Survivor Curves



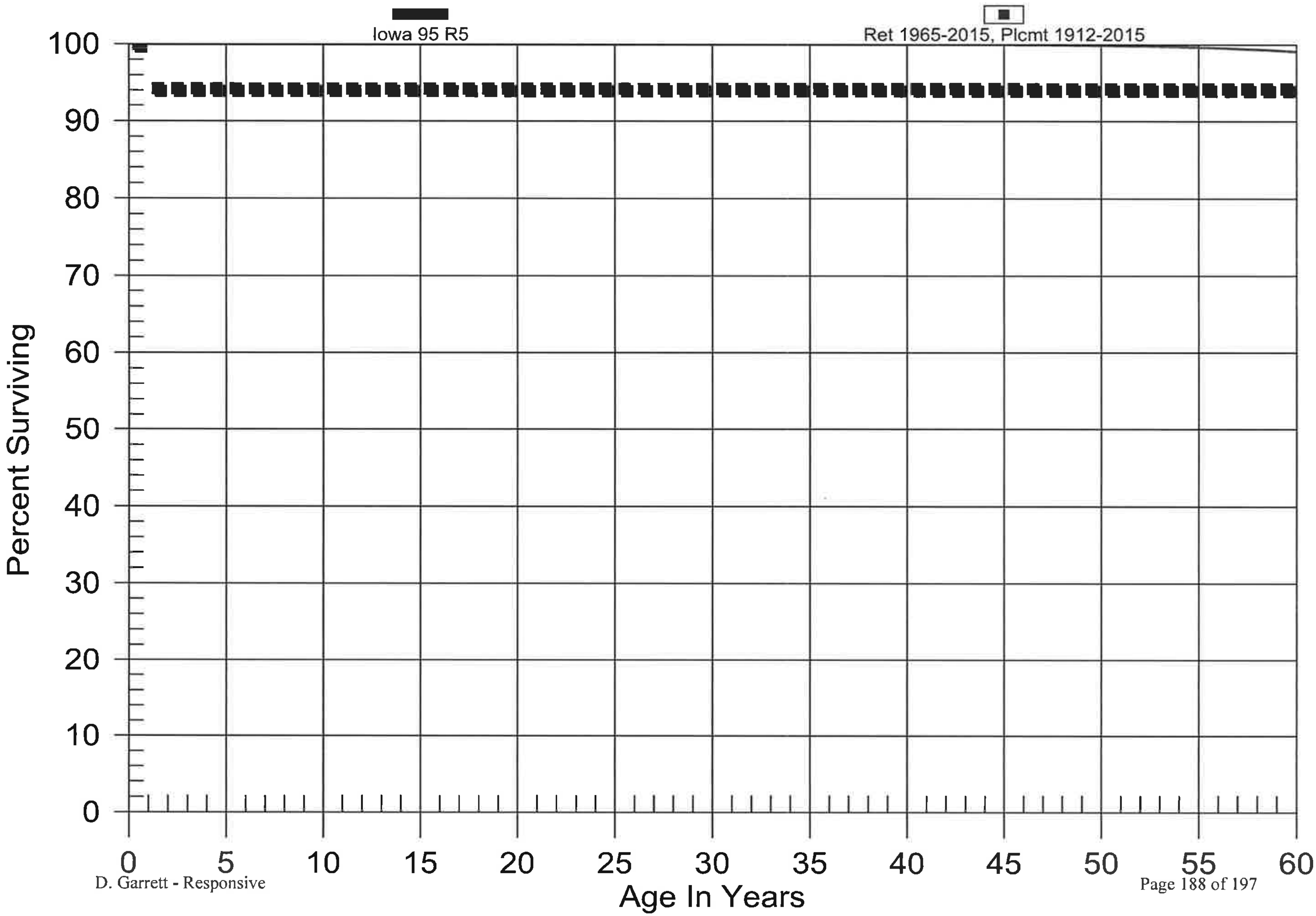
SPPC

Electric Division
359.00 Roads and Trails
Original And Smooth Survivor Curves



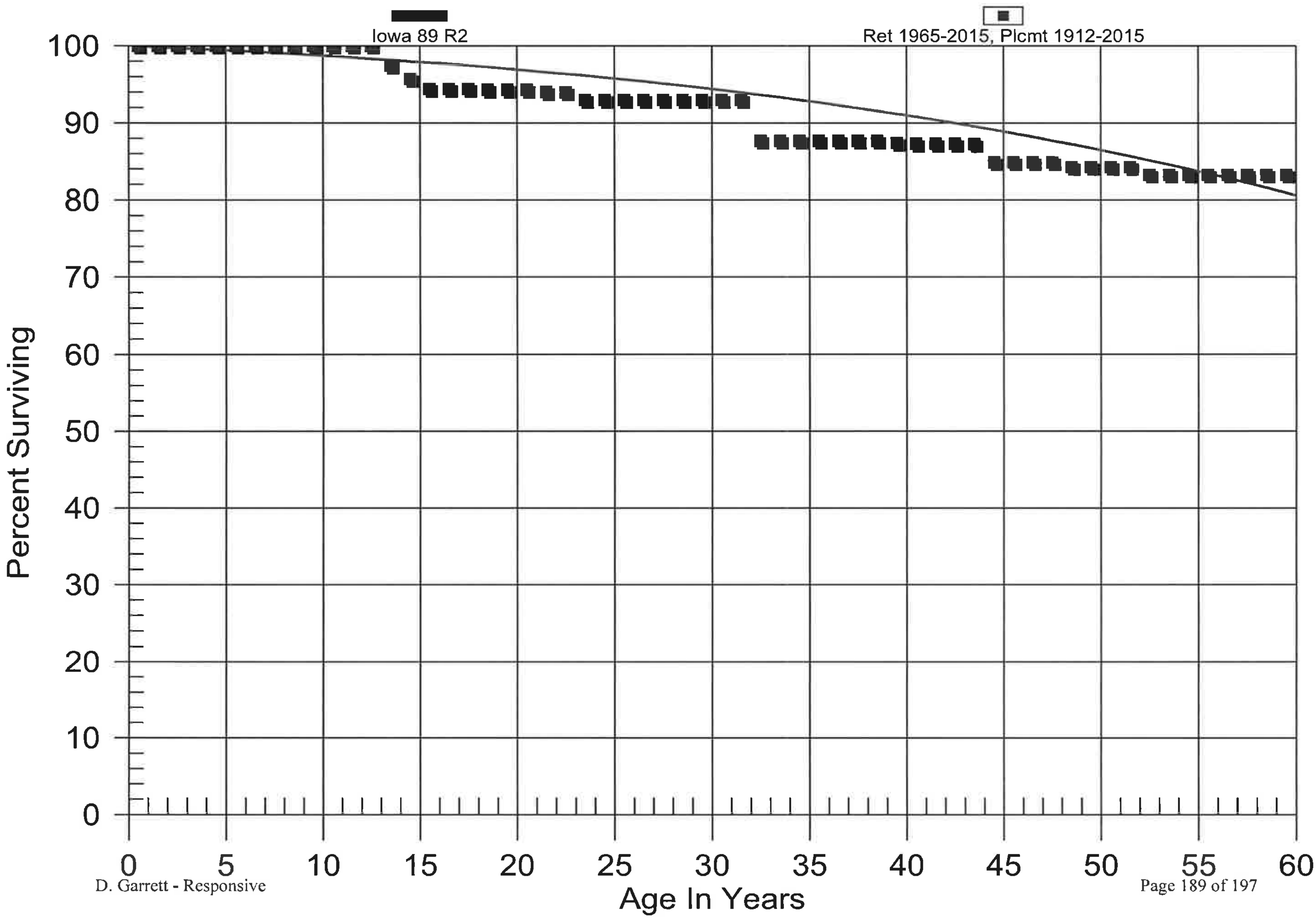
SPPC

Electric Division
360.20 Land Rights
Original And Smooth Survivor Curves



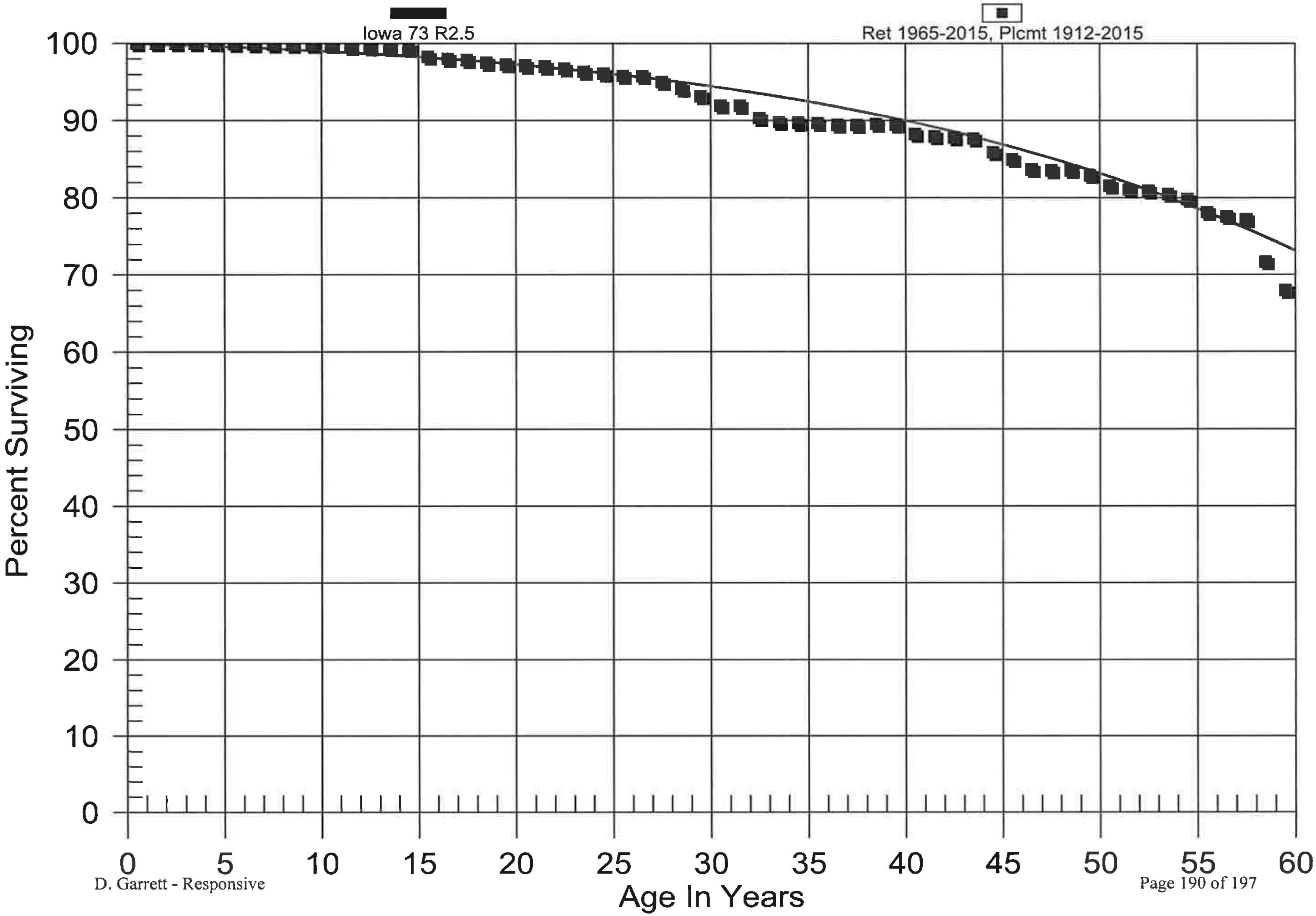
SPPC

Electric Division
361.00 Structures and Improvements
Original And Smooth Survivor Curves



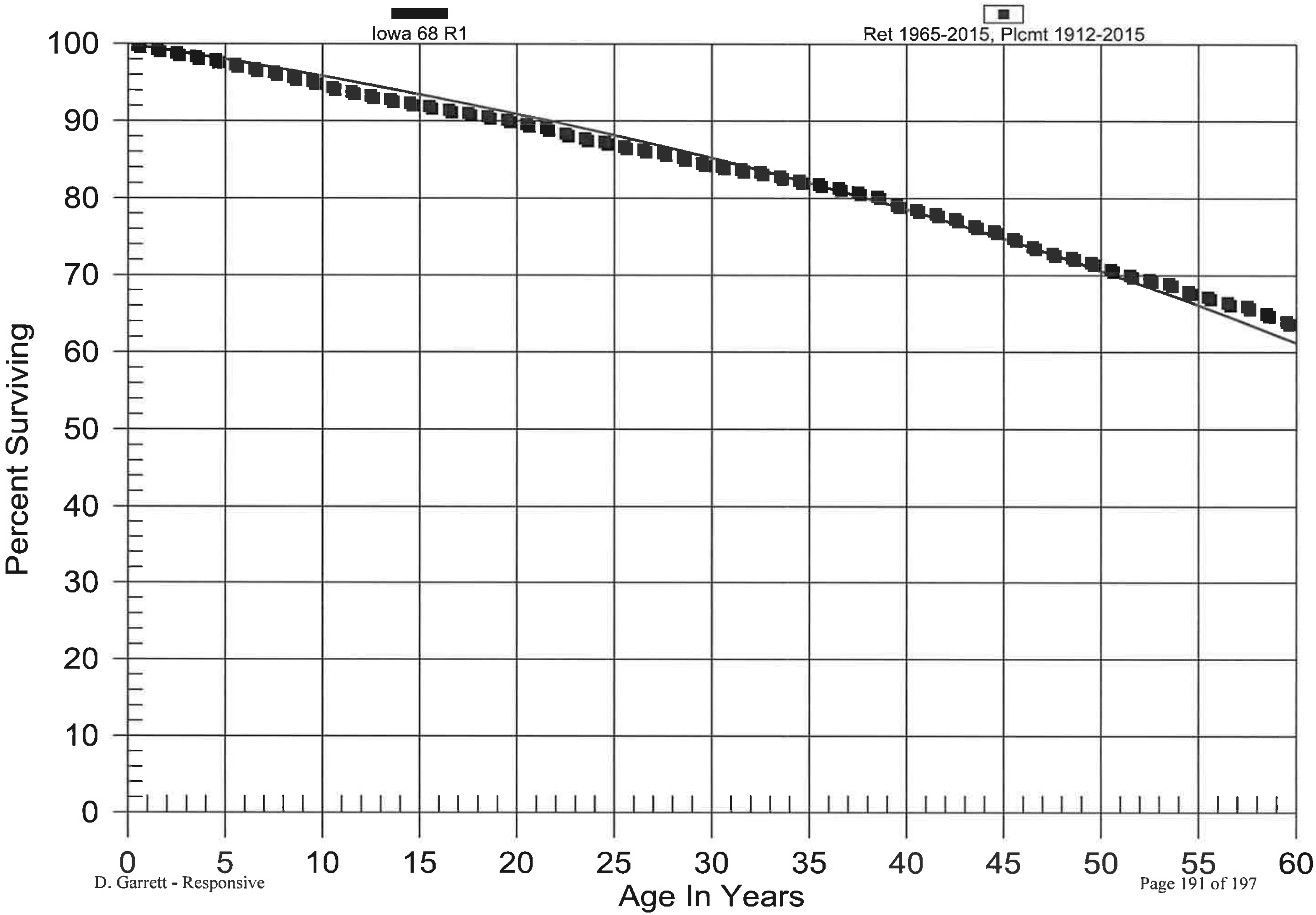
SPPC

Electric Division
362.00 Station Equipment
Original And Smooth Survivor Curves



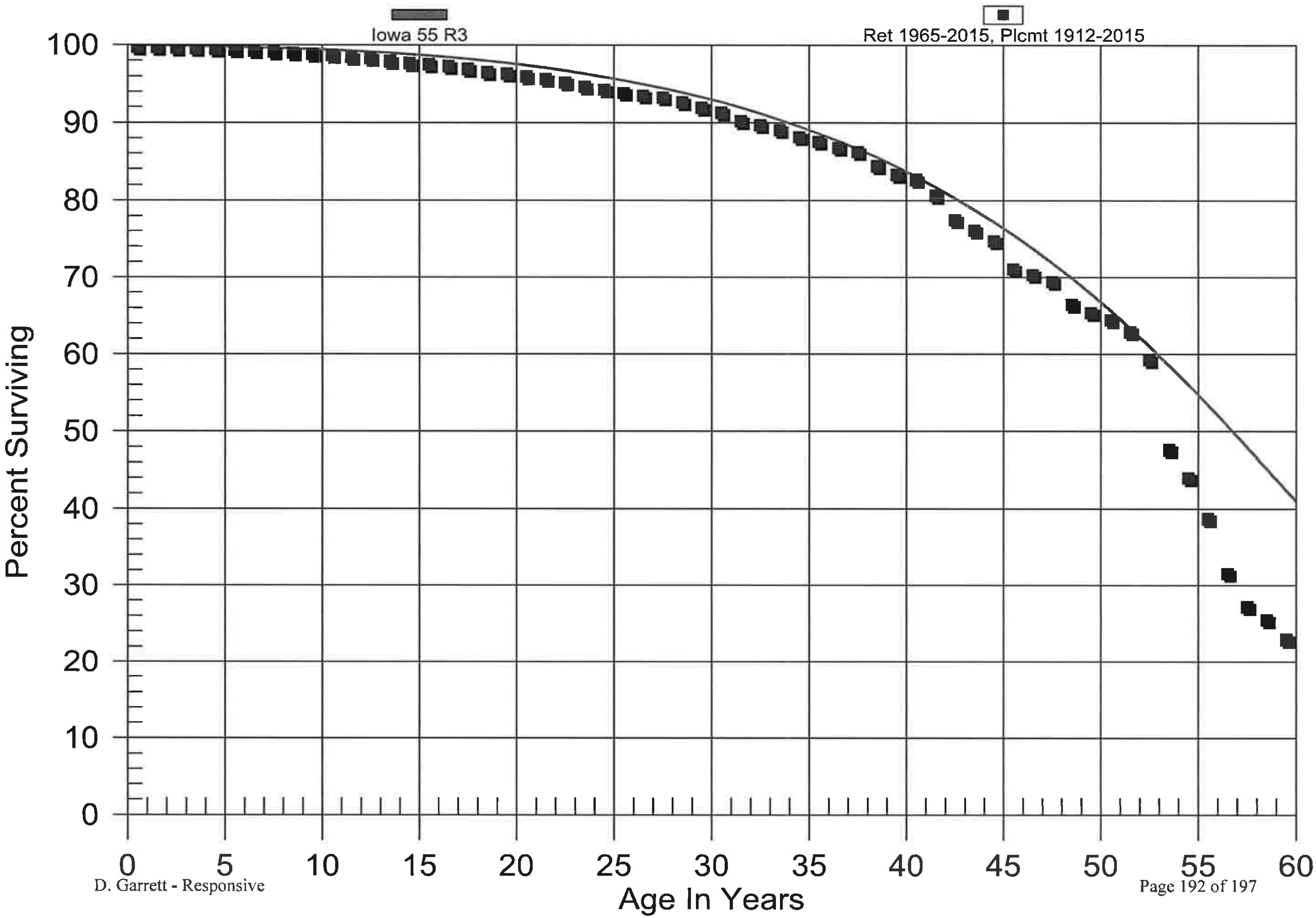
SPPC

Electric Division
364.00 Poles, Towers, and Fixtures
Original And Smooth Survivor Curves



SPPC

Electric Division
365.00 Overhead Conductors and Devices
Original And Smooth Survivor Curves



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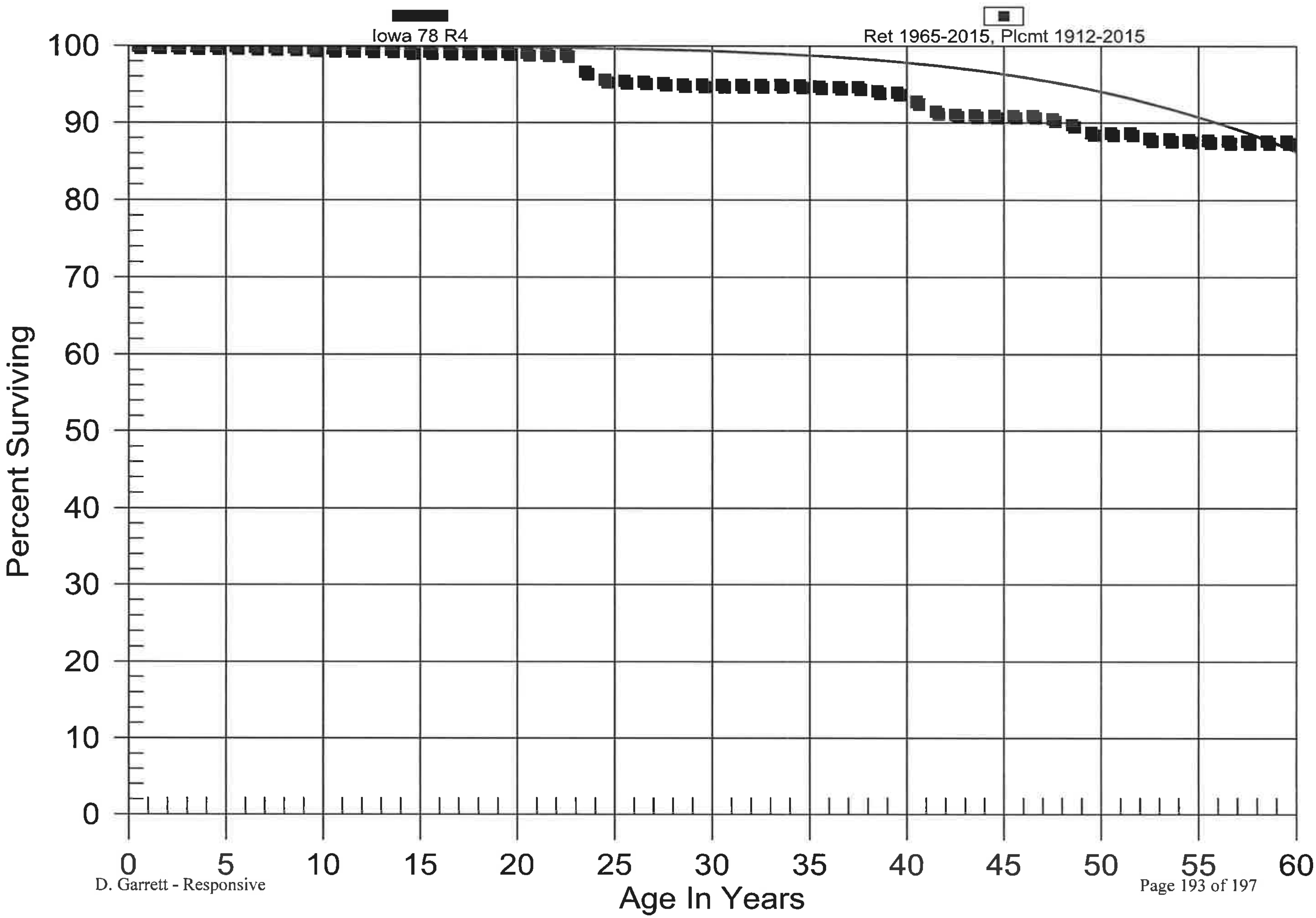
Electric Division
366.00 Underground Conduit
Original And Smooth Survivor Curves



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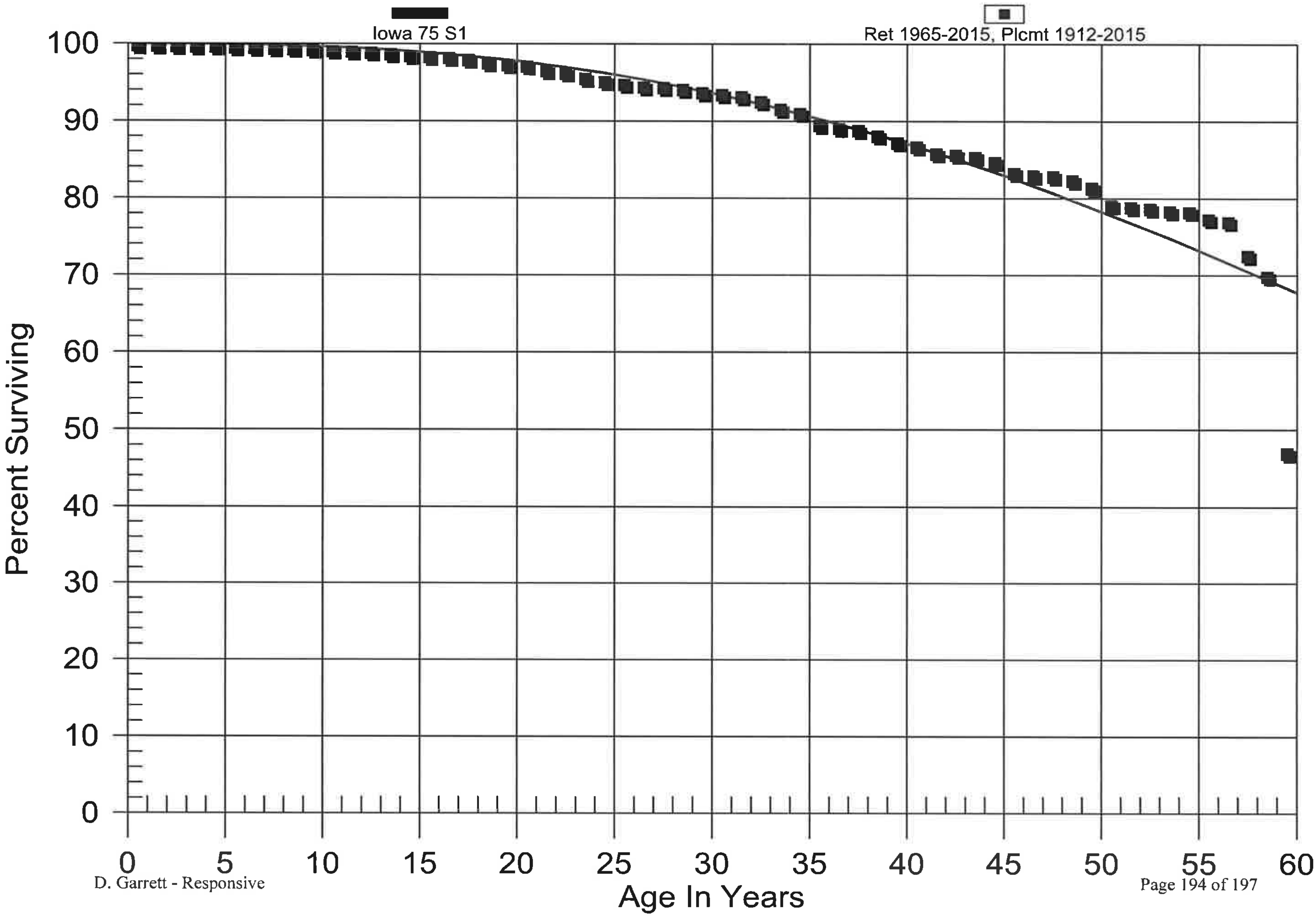
Electric Division
367.00 Underground Conductors and Devices
Original And Smooth Survivor Curves



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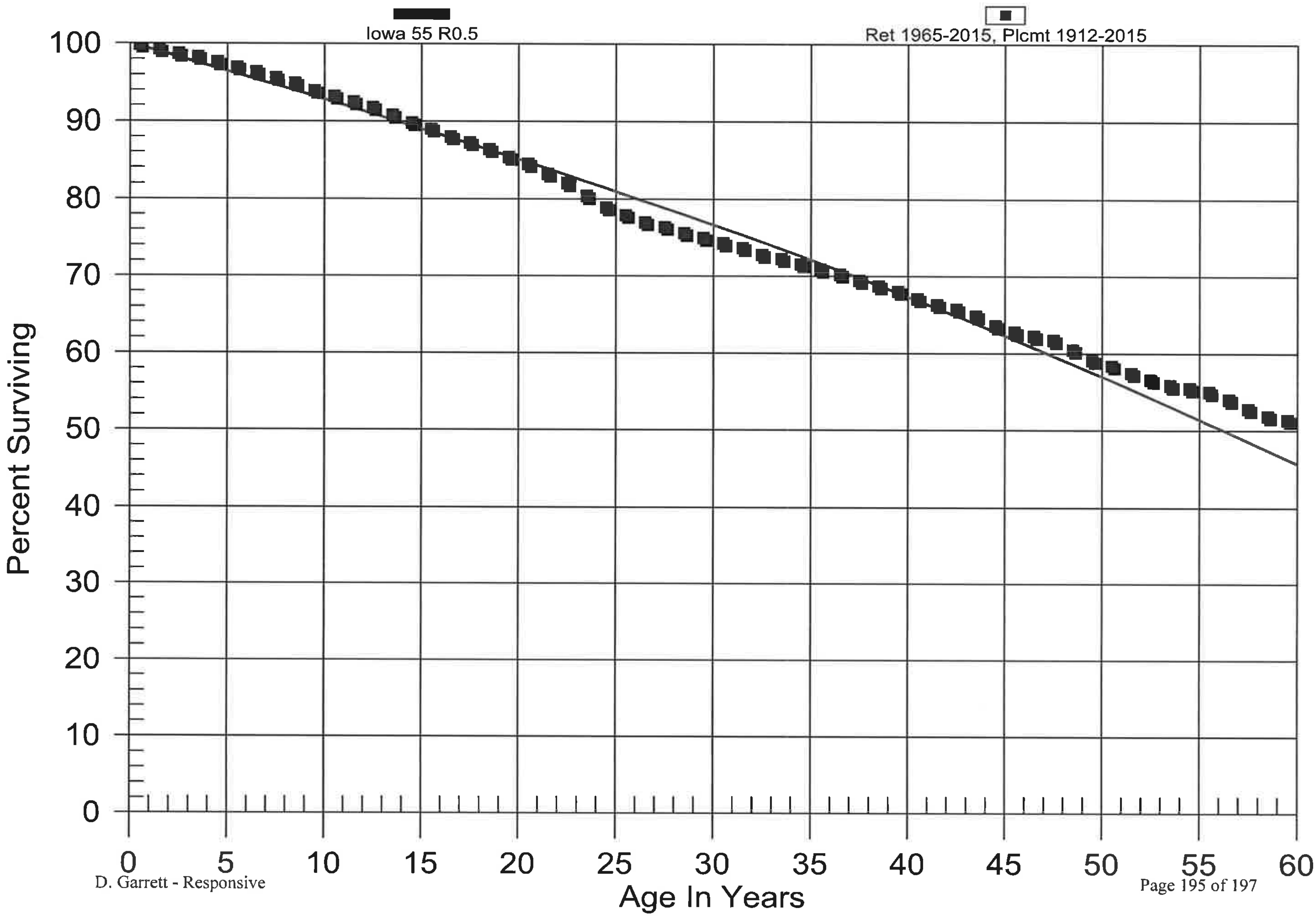
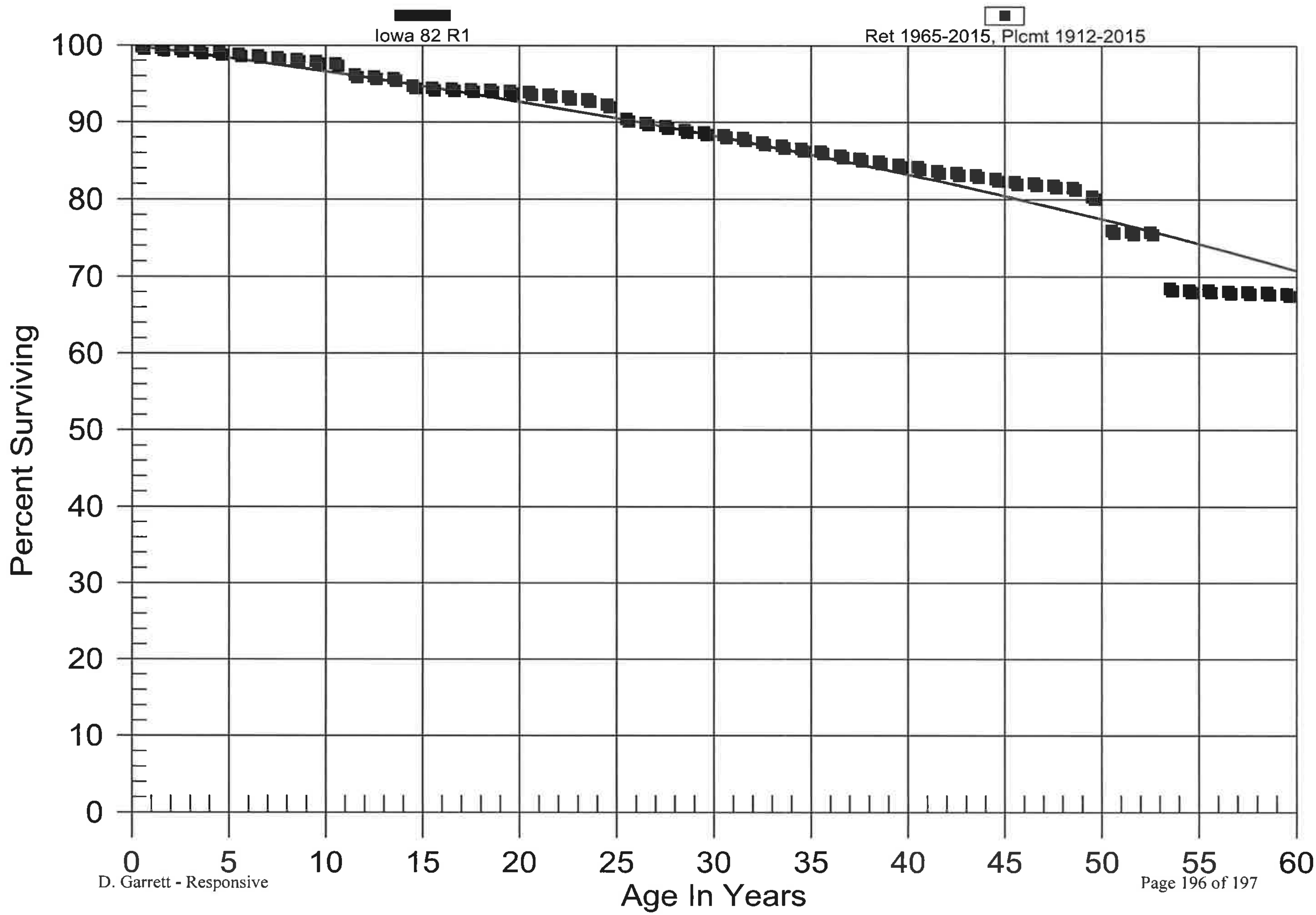
Electric Division
368.00 Line Transformers
Original And Smooth Survivor Curves



SPPC

Electric Division
369.00 Services
Original And Smooth Survivor Curves



SPPC

Electric Division
390.00 Structures and Improvements
Original And Smooth Survivor Curves