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APPLICATION OF CENTERPOINT	§	PUBLIC UTILITY COMMISSION
ENERGY HOUSTON ELECTRIC, LLC	§	
FOR AUTHORITY TO CHANGE RATES	§	OF TEXAS

DIRECT TESTIMONY

OF

DANE A. WATSON, PE, CDP

ON BEHALF OF

CENTERPOINT ENERGY HOUSTON ELECTRIC, LLC

MARCH 9, 2024

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LIST OF EXHIBITS

GLOSSARY OF ACRONYMS AND DEFINED TERMS

Acronym	Definition
ALG	Average Life Group
CenterPoint Houston or Company	CenterPoint Energy Houston Electric, LLC
Commission	Public Utility Commission of Texas
EEI	Edison Electric Institute
FERC	Federal Energy Regulatory Commission
IEEE	Institute of Electrical and Electronics Engineers
SDP	Society of Depreciation Professionals
SPR	Simulated Plant Record
Test Year	12 Months Ending December 31, 2023
TXU	Texas Utilities Electric Company and successor companies

EXECUTIVE SUMMARY - DEPRECIATION

DANE A. WATSON, PE, CDP

I have performed a depreciation study of CenterPoint Energy Houston Electric, LLC's ("CenterPoint Houston" or the "Company") assets based on the depreciable plant in service as of December 31, 2022. The results of my depreciation study support an annualized depreciation and amortization expense for CenterPoint Houston of approximately $558.1 million, consisting of $50.5 million for intangible plant and $507.6 million for transmission distribution and general property. This represents an overall increase of approximately $35.7 million compared to the Company's annualized depreciation and amortization expense at current rates. Compared to the rates currently in effect, the proposed depreciation and amortization expense consists of an increase of $0.5 million for Intangible Plant, an increase of $10.2 million for Transmission assets, an increase of $21.9 million for Distribution assets, an increase of $2.8 million for General Depreciated assets, an increase of $0.2 million in General Amortized assets, and no change for the reserve difference for General Amortized assets.

Detailed information regarding the service life and net salvage characteristics that support my proposed depreciation and amortization rates can be found in the depreciation study marked as Exhibit DAW-1, as well as in my workpapers.

DIRECT TESTIMONY OF DANE A. WATSON, PE, CDP

I. POSITION AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAME AND BY WHOM YOU ARE EMPLOYED.

A. My name is Dane A. Watson. I am a Partner of Alliance Consulting Group. Alliance Consulting Group provides consulting and expert services to the utility industry.

Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING?

A. I am filing testimony on behalf of CenterPoint Energy Houston Electric, LLC ("CenterPoint Houston" or the "Company"), a wholly owned subsidiary of CenterPoint Energy, Inc.

Q. PLEASE DESCRIBE YOUR EDUCATIONAL BACKGROUND.

A. I hold a Bachelor of Science degree in Electrical Engineering from the University of Arkansas at Fayetteville and a Master's Degree in Business Administration from Amberton University.

Q. DO YOU HOLD ANY SPECIAL CERTIFICATION AS A DEPRECIATION EXPERT?

A. Yes. The Society of Depreciation Professionals ("SDP") has established national standards for depreciation professionals. The SDP administers an examination and has certain required qualifications to become certified in this field. I met all requirements and hold a Certified Depreciation Professional certification.

Q. PLEASE DESCRIBE YOUR PROFESSIONAL EXPERIENCE.

A. Since graduating from college in 1985, I have worked in the area of depreciation and valuation. I founded Alliance Consulting Group in 2004 and am responsible for conducting depreciation, valuation, and certain accounting-related studies for clients in various industries. My duties related to depreciation studies include the assembly and analysis of historical and simulated data, conducting field reviews, determining service life and net salvage estimates, calculating annual depreciation, presenting recommended depreciation rates to utility management for its consideration, and supporting such rates before regulatory bodies.

My prior employment from 1985 to 2004 was with Texas Utilities Electric Company and successor companies ("TXU"). During my tenure with TXU, I was responsible for, among other things, conducting valuation and depreciation studies for the domestic TXU companies. During that time, I served as Manager of Property Accounting Services and Records Management in addition to my depreciation responsibilities.

I have twice been Chair of the Edison Electric Institute ("EEI") Property Accounting and Valuation Committee and have been Chairman of EEI's Depreciation and Economic Issues Subcommittee. I am a Registered Professional Engineer in the State of Texas and a Certified Depreciation Professional. I am a Senior Member of the Institute of Electrical and Electronics Engineers ("IEEE") and served for several years as an officer of the Executive Board of the Dallas Section of IEEE as well as national and worldwide offices. I have served as President of the SDP twice.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE ANY REGULATORY COMMISSIONS?

A. Yes. In my 39-year career, I have testified in more than 325 proceedings before approximately 40 regulatory commissions across North America. I have also presented expert testimony before the Federal Energy Regulatory Commission ("FERC"). A complete listing of my filed written testimony is provided in Exhibit DAW-2.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THE PUBLIC UTILITY COMMISSION OF TEXAS?

A. Yes. I have conducted depreciation studies and filed testimony on depreciation and valuation issues before the Public Utility Commission of Texas ("Commission") in Docket Nos. 11735, 12160, 15195, 16650, 18490, 20285, 22350, 23640, 24040, 32766, 34040, 35763, 35717, 38147, 38339, 38480, 36633, 38929, 41474, 42004, 42469, 43695, 43950, 44746, 44704, 45414, 46957, 47527, 48371, 48231, 48401, 49421, 49831, 50288, 50734, 50557, 53601, 53719, 54634. 54565, and 55867.

II. PURPOSE AND SUMMARY OF DIRECT TESTIMONY

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY IN THIS PROCEEDING?

A. The purpose of my testimony is to discuss the recent depreciation study completed for CenterPoint Houston assets on the Company's depreciable and amortizable plant in service and support and justify the recommended depreciation rate changes for CenterPoint Houston assets based on the results of the depreciation study.

Q. BASED ON YOUR DEPRECIATION STUDY, WHAT IS THE RECOMMENDED DEPRECIATION EXPENSE IN THIS PROCEEDING?

A. Based on the depreciation study, which analyzed the Company's intangible, transmission, distribution and general plant in service at December 31, 2022, my recommendations result in an annualized depreciation expense for CenterPoint Houston of approximately $558.8 million. This represents an overall increase of approximately $35.7 million compared to the Company's annualized depreciation expense at current rates. Compared to the depreciation rates currently in effect, the proposed annual depreciation and amortization expense consists of an increase of $0.5 million for Intangible Plant, an increase of $10.2 million for Transmission assets, an increase of $21.9 million in Distribution assets, an increase of $2.8 million for General Depreciated assets, an increase of $0.2 million for General Amortized assets, and no change for the reserve difference for General Amortized assets.

Q. WHAT ARE THE PRIMARY FACTORS THAT INFLUENCED THE CHANGE IN THE COMPANY'S DEPRECIATION RATES?

A. In many instances, CenterPoint Houston is experiencing service lives for its assets that are longer than the service lives reflected in its current depreciation rates, which were based on a year-end 2017 depreciation study. As a result, I recommend a change in the service life for numerous accounts in the Transmission, Distribution, and General Plant functional groups in order to accurately reflect the Company's more recent retirement experience. Also, both the Company's statistical data and field experience indicate that the accounts in Transmission and Distribution continue to demonstrate increased cost of removal resulting in increasingly negative net salvage. The depreciation rates I recommend for adoption in this case reflect the changing life and net salvage characteristics being experienced by CenterPoint Houston.

III. CENTERPOINT HOUSTON DEPRECIATION STUDY

A. Summary of the Depreciation Study Results

Q. HAVE YOU PREPARED A COMPREHENSIVE DEPRECIATION STUDY FOR CENTERPOINT HOUSTON?

A. Yes. I have conducted a depreciation study for CenterPoint Houston based on the Company's depreciable plant in service at December 31, 2022. The depreciation study analyzes the property characteristics of the Company's intangible plant, transmission plant, distribution plant, and general plant and proposed depreciation rates for these assets. The study is attached to my testimony as Exhibit DAW-1.

Q. WHAT PROPERTY IS INCLUDED IN THE DEPRECIATION STUDY?

A. There are five distinct groups of property, each of which has separate depreciation/amortization rates by plant account: (1) Intangible, (2) Transmission, (3) Distribution, (4) General Depreciated (excludes Amortized Accounts), and (5) General Amortized property. The Intangible functional group contains computer software and other computer-related assets. The Transmission functional group primarily contains towers, poles, station equipment and conductors used to transmit electricity to various points for entry into the distribution system. The Distribution functional group primarily contains distribution lines and associated facilities used to distribute electricity. The General functional group has been split into two groups, depreciated and amortized. The General Depreciated functional group contains facilities and equipment associated with the overall operation of the business, such as office buildings, warehouses, service centers, transportation and power operated equipment. The General Amortized functional group contains assets associated with the overall operation of the business such as office and computer equipment, stores, tools, and other miscellaneous equipment. All General plant is used in overall operations of the business rather than with a specific Transmission or Distribution classification.

Q. HOW WERE THE RESULTS OF YOUR DEPRECIATION STUDY USED TO CALCULATE THE COMPANY'S REQUESTED DEPRECIATION EXPENSE?

A. The Company applied my recommended depreciation rates to its adjusted plant balances as of December 31, 2023 to calculate its test year depreciation expense.

Q. WHEN WERE THE COMPANY'S DEPRECIATION RATES LAST UPDATED?

A. The last change in the Company's depreciation rates occurred on April 23, 2020. The depreciation rates were established in Docket No. 49421 based on a depreciation study of plant in service at December 31, 2017.

Q. ARE YOU PROPOSING A CHANGE IN AMORTIZATION EXPENSE FOR INTANGIBLE ASSETS BASED ON YOUR STUDY?

A. Yes. Based on my study, the annual amortization expense for Intangible assets should be increased by approximately $0.5 million per year. This amount was determined by comparing the amortization expense between the current rates and the proposed rates as applied to December 31, 2022 investment for Intangible assets as shown in Exhibit DAW-1, Appendix B.

Q. ARE YOU PROPOSING A CHANGE IN DEPRECIATION EXPENSE FOR TRANSMISSION ASSETS BASED ON YOUR STUDY?

A. Yes. Based on my study, the annual depreciation expense for Transmission assets should be increased by approximately $10.2 million per year. This amount was determined by comparing the depreciation expense between the current rates and the proposed rates as applied to December 31, 2022 investment for Transmission assets as shown in Exhibit DAW-1, Appendix B.

Q. ARE YOU PROPOSING A CHANGE IN DEPRECIATION EXPENSE FOR DISTRIBUTION ASSETS, EXCLUDING CERTAIN METERS, BASED ON YOUR STUDY?

A. Yes. Based on my study, the annual depreciation expense for Distribution assets should be increased by approximately $21.9 million per year. This amount was determined by comparing the depreciation expense between the current rates and the proposed rates as applied to December 31, 2022 investment for Distribution assets as shown in Exhibit DAW-1, Appendix B.

Q. ARE YOU PROPOSING A CHANGE IN DEPRECIATION EXPENSE FOR GENERAL DEPRECIATED ASSETS, BASED ON YOUR STUDY?

A. Yes. Based on my study the annual depreciation expense for General Depreciated assets should be increased by approximately $2.8 million per year. This amount was determined by comparing the depreciation expense between the current rates and the proposed rates as applied to December 31, 2022 investment for General Depreciated assets as shown in Exhibit DAW-1, Appendix B.

Q. ARE YOU PROPOSING A CHANGE IN AMORTIZATION EXPENSE FOR GENERAL AMORTIZED ASSETS BASED ON YOUR STUDY?

A. Yes. Based on my study, the annual amortization expense for General Amortized assets should be increased by approximately $0.2 million per year. This amount was determined by comparing the amortization expense between the current rates and the proposed rates as applied to December 31, 2022 investment for General Amortized assets and an amount for the amortization of the reserve difference, as shown in Exhibit DAW-1, Appendix B.

Q. AS PART OF YOUR DEPRECIATION ANALYSIS, HAVE YOU TAKEN ANY ACTION TO PROPERLY ALIGN THE COMPANY'S DEPRECIATION RESERVE WITH THE LIFE CHARACTERISTICS OF THE TRANSMISSION, DISTRIBUTION, AND GENERAL PLANT FUNCTIONS?

A. Yes. In the process of analyzing the Company's depreciation reserve, I observed that the depreciation reserve positions of the various accounts needed to be re-balanced based on my recommended service lives and net salvage ratios. To allow the relative reserve positions of each account within a function to mirror the life characteristics of the underlying assets, I reallocated the depreciation reserves for all accounts within each function.

Q. DOES THE REALLOCATION OF THE DEPRECIATION RESERVE CHANGE THE TOTAL RESERVE?

A. No. The depreciation reserve represents the amounts that customers have contributed to the return of the investment. The reallocation process does not change the total reserve for each function; it simply reallocates the reserve between accounts within each function.

Q. IS DEPRECIATION RESERVE REALLOCATION A SOUND DEPRECIATION PRACTICE?

A. Yes. The practice of depreciation reserve allocation is widely recognized and commonly practiced as part of a comprehensive depreciation study for the purposes of setting regulated rates where changes in services lives result in an imbalance between the theoretical and book reserve.[1] With respect to CenterPoint Houston, my depreciation study demonstrates that there have been significant changes in the life of the property since the last depreciation study.[2] These changes have created imbalances between the theoretical and the book reserve for various accounts within each function making the reallocation of the depreciation reserve appropriate in this instance.

Q. HAS THE COMMISSION APPROVED DEPRECIATION RESERVE REALLOCATION IN OTHER RATE PROCEEDINGS?

A. Yes. The Commission has regularly approved depreciation reserve reallocation. Reserve re-allocation was approved in the Company's last rate proceeding, Docket No. 49421. I am also aware that it was approved in Docket Nos. 53601, 53719, and 54634.

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[1] *Public Utility Depreciation Practices*, NARUC (1968), p. 48; *Public Utility Depreciation Practices*, NARUC (1996), p. 188.

[2] The depreciation study in Docket No. 49421 was based on plant activity through year end 2017. This study is based on plant activity through year end 2022, thus including an additional five years of data.

Q. HOW WILL THE COMPANY IMPLEMENT THE REALLOCATION OF ITS DEPRECIATION RESERVE IF ITS PROPOSED RATES ARE APPROVED?

A. Assuming the proposed depreciation rates are approved, the Company will reallocate the reserves on its books to match the allocation performed in this study.

B. Overview of Depreciation Study Methodology

Q. WHAT DEFINITION OF DEPRECIATION HAVE YOU USED FOR THE PURPOSES OF CONDUCTING YOUR DEPRECIATION STUDY AND PREPARING YOUR TESTIMONY?

A. From an accounting perspective, the term "depreciation," as used herein, is defined as a system that distributes the cost of assets, less net salvage (if any), over the estimated useful life of the assets in a systematic and rational manner. It is a process of allocation, not valuation. Depreciation expense is systematically allocated to accounting periods over the life of the properties. The amount allocated to any one accounting period does not necessarily represent the loss or decrease in value that will occur during that particular period. Thus, depreciation is considered an expense or cost, rather than a loss or decrease in value. The Company accrues depreciation based on the original cost of all property included in each depreciable plant account. Upon retirement, the full cost of depreciable property, less the net salvage amount, if any, is charged to the depreciation reserve.

Q. PLEASE DESCRIBE YOUR DEPRECIATION STUDY APPROACH.

A. I conducted the depreciation study in four phases as shown in my Exhibit DAW-1. The four phases are: Data Collection, Analysis, Evaluation, and Calculation. I began each of the studies by collecting the historical data to be used in the analysis. After the data had been assembled, I performed analysis to determine the life and net salvage percentage for the different property groups being studied. As part of this process, I conferred with field personnel, engineers, and managers responsible for the installation, operation, and removal of the assets to gain their input into the operation, maintenance, and salvage of the assets. The information obtained from field personnel, engineers and managerial personnel, combined with the study results, is then evaluated. This evaluation resulted in the determination of life and net salvage parameters by considering the results of the historical asset activity, the Company's current operations and asset characteristics, and the Company's future expectations for the assets. Using the appropriate life and net salvage parameters as found in the evaluation, I then calculated the depreciation rate for each function.

Q. WHAT DEPRECIATION METHODOLOGY WAS USED TO CONDUCT YOUR DEPRECIATION STUDY?

A. The straight-line, Average Life Group ("ALG") and remaining-life depreciation system were employed to calculate annual and accrued depreciation in the studies.

Q. HOW ARE THE DEPRECIATION RATES DETERMINED?

A. In the ALG procedure, the annual depreciation expense for each account is computed by dividing the original cost of the asset, less allocated depreciation reserve, less estimated net salvage, by its respective remaining life. The resulting annual accrual amount of depreciable property within an account is divided by the original cost of the depreciable property in the account to determine the depreciation rate. The calculated remaining lives and annual depreciation accrual rates were based on attained ages of plant in service and the estimated service life and salvage characteristics of each depreciable group. The comparison of the current and recommended annual depreciation and amortization rates is shown in my Exhibit DAW-1, Appendix B. The remaining life calculations are discussed below and are shown in my Exhibit DAW-1, Appendix A.

C. Service Lives

Q. WHAT IS THE SIGNIFICANCE OF AN ASSET'S USEFUL LIFE IN YOUR DEPRECIATION STUDY?

A. An asset's useful life is used to determine the remaining life over which the remaining cost (original cost plus or minus net salvage, minus accumulated depreciation) can be allocated through future periods.

Q. HOW DID YOU DETERMINE THE AVERAGE SERVICE LIVES FOR EACH ACCOUNT?

A. The establishment of an appropriate average service life for each account within a functional group was determined by using one of two widely accepted depreciation analyses: Actuarial analysis or Simulated Plant Record ("SPR") methods. Specifically, the service life for each account within the Transmission and Distribution functional groups was determined by using the SPR method of life analysis. For General Plant Depreciated assets, average service lives were established using the Actuarial method of life analysis. Graphs and tables supporting the actuarial or SPR analysis and the chosen Iowa Curves used to determine the average service lives for each account are found in my Exhibit DAW-1 and my depreciation study workpapers.

Q. YOU MENTIONED PREVIOUSLY THAT ASSET LIVES WERE INCREASING. WHAT IS THE GENERAL CAUSE OF THE INCREASE IN ASSET LIVES FOR THE TRANSMISSION AND DISTRIBUTION FUNCTIONAL GROUPS?

A. Generally, the lengthening of service lives for transmission assets can be attributed to improved materials and installation practices, as well as more robust maintenance practices that extend the life of the assets. Distribution plant is also experiencing longer service lives due to the implementation of aggressive preventative maintenance programs that have increased the useful lives of distribution function assets. While there are factors that have limited the increasing lives for certain types of assets—such as the use of new growth trees for poles instead of old growth trees—other programs, like physical pole inspection and treatment programs, are helping to extend the lives of the assets.

Q. WHAT LIFE INDICATIONS ARE SEEN FOR BOTH (DEPRECIATED AND AMORTIZED) GENERAL PLANT GROUPS?

A. Overall, the life indications in the General Plant Group are increasing or staying the same with the exception of three accounts: Laboratory Equipment, Power Operated Equipment, and Other Communication Equipment. These three accounts are experiencing shorter lives than were exhibited when the current rates were adopted, for the reasons explained in my study.

Q. DOES YOUR DEPRECIATION STUDY REFLECT THE CHANGES IN THE USEFUL LIVES OF THE INTANGIBLE, TRANSMISSION, DISTRIBUTION, AND GENERAL PLANT FUNCTION ASSETS?

A. It does by relying on the historical statistical indications seen in the analysis, the Company-specific expectations and experience of its operations and engineering subject matter experts, and my 39 years of depreciation experience.

Q. WHAT PROCESS HAVE YOU UNDERTAKEN TO GIVE EFFECT TO BOTH HISTORICAL DATA AND COMPANY-SPECIFIC EXPECTATIONS IN DEVELOPING YOUR SERVICE LIFE RECOMMENDATIONS?

A. In order to achieve a reasonable balance between these critical components of the life analysis, I evaluated the statistical historical data and then applied informed judgment to make the most appropriate service life selections. The objective in any depreciation study is to project the remaining cost (installation, material and removal cost) to be recovered and the remaining periods in which to recover the costs. This necessarily requires that the service life selections reflect both the Company's historical experience and its current expectations of asset lives. In order to understand the Company's expectations regarding asset lives, I interviewed Company engineers working in both operations and maintenance to confirm the historical activity and indications, current and future plans, and the applicability to the future surviving assets. The interview process also provides important information regarding changes in materials and operation and maintenance, as well as the Company's current expectations regarding the service lives of the assets currently in use. This information is then considered along with the historical statistical data to develop the most reasonable and representative expected service lives for the Company's assets. The result of this analysis is reflected in the service life recommendations set forth in my depreciation study.

Q. CAN YOU PROVIDE AN EXAMPLE OF THE IMPORTANT INFORMATION YOU GLEANED FROM YOUR DISCUSSIONS WITH COMPANY PERSONNEL?

A. Yes. For instance, as part of the interview process, I interviewed Company engineers regarding the service lives for Transmission Poles and Fixtures (FERC Account 355). While the statistical analysis indicated a life in the 20-year range for these assets, my interviews with Company engineers revealed that this statistical service life indication was much shorter than the Company's actual expectations. The Company's engineers noted that the Company has changed from wood to concrete poles, which have a much longer life expectation. Consequently, Company engineers now expect poles to realize a service life of approximately 60 years. I relied on this information in order to properly evaluate the historical statistical data. Based on my interview with Company personnel and informed judgment based on my years of analyzing these types of assets, I recommended lengthening the life of Transmission Poles beyond the historical indications in order to achieve a more accurate service life that is reflective of the operational changes affecting these assets. Please see the Interview Notes provided as part of this study's workpapers and the Depreciation Study Report,

Exhibit DAW-1, for more information about this account and others that I utilized in my analysis.

Q. HAVE YOU PREPARED A SUMMARY OF THE LIFE CHANGES BY ACCOUNT?

A. Yes. Figure 1 below provides the approved and proposed life by account for all four functions: Intangible, Transmission, Distribution, and General Plant.

Figure 1

Account	Description	Approved Life	Approved Curve	Proposed Life	Proposed Curve
E30302	Software 3 year	NA	NA	3	SQ
E30302	Software 5 year	5	SQ	5	SQ
E30302	Software 7 year	7	SQ	7	SQ
E30302	Software 10 year	10	SQ	10	SQ
E30302	Software 15 Year	15	SQ	15	SQ
E35002	Land Rights	75	R1	75	R1
E35201	Structures & Improvements	60	R1.5	61	R2
E35301	Station Equipment	53	R0.5	54	R0.5
E35401	Towers & Fixtures	59	R2.5	60	R2.5
E35501	Poles and Fixtures	60	R0.5	60	R0.5
E35601	O/H Conduct/Devices	61	R1.5	60	R1.5
E35701	Underground Conduit	60	R5	75	S6
E35801	U/G Conduct/Devices	44	S6	44	S6
E35901	Roads and Trails	52	S6	45	S6
E36002	Land Rights	60	R1	65	R1
E36101	Structures. & Improvements	60	R4	60	R4
E36201	Station Equipment	48	R1	49	R1
E36301	Battery Storage Equipment	10	SQ	10	SQ
E36401	Poles, Towers & Fixtures	35	R0.5	37	R0.5
E36501	O/H Conduct Devices	38	R0.5	38	R0.5
E36601	Underground Conduit	62	R2.5	64	R2.5
E36701	U/G Conduct/Devices	38	R0.5	41	R0.5
E36801	Line Transformers	28	R1	29	R0.5
E36901	Services	46	R0.5	54	R0.5
E37001	Meters	21	R3	40	R3
E37001	AMS Meters	20	R2	20	R2
E37301	Street Light/Signal Systems	39	R1	39	R1.5

E37401	Security Lighting	39	R1	39	R1.5
E38902	Land Rights	55	R2	55	R2
E39001	Structures & Improvements	50	R4	53	R4
E39101	Office F/F	24	SQ	24	SQ
E39201	Transportation Equipment	13	L2	13	L2.5
E39301	Stores Equipment	19	SQ	19	SQ
E39401	Tools, Shop & Garage Equipment	18	SQ	18	SQ
E39501	Laboratory Equipment	25	SQ	25	SQ
E39601	Power Operated Equipment	18	L2	12	L2.5
E39701	Microwave Equipment	22	R2	22	R1
E39701.0130	Other Communication Equip	22	R2	8	S1.5
E39702	Computer Equipment	8	SQ	8	SQ
E39801	Miscellaneous. Equipment	20	SQ	20	SQ

Q. ARE THESE SERVICE LIVES REASONABLE BASED ON YOUR STUDY?

A. Yes.

D. Net Salvage

Q. WHAT IS NET SALVAGE?

A. As discussed more fully in my depreciation study, Exhibit DAW-1, net salvage is the difference between the gross salvage (what is received in scrap value for the asset when retired) and the removal cost (cost to remove and dispose of the asset). Salvage and removal cost percentages are calculated by dividing the current cost of salvage or removal by the original installed cost of the asset. When salvage exceeds removal (positive net salvage), the net salvage reduces the amount to be depreciated over time. When removal exceeds salvage (negative net salvage), the negative net salvage increases the amount to be recovered through depreciation.

Q. DOES CENTERPOINT HOUSTON HAVE ANY NET SALVAGE REFLECTED IN ITS EXISTING DEPRECIATION RATES?

A. Yes. However, the net salvage reflected in its existing depreciation rates was approved in Docket No. 49421, whereas the current study includes an additional five years of data. Both the Company's statistical data and input from Company engineers confirm that the net salvage reflected in the Company's current depreciation rates is no longer representative of the costs incurred to retire CenterPoint Houston's assets. These retirement costs have increased over the last several years and require that net salvage rates be adjusted to reflect this reality, which I have done in my study.

Q. WERE THE INCREASES IN RETIREMENT COST DRIVEN BY ANY CHANGE IN WORK PROCESS OR ALLOCATION METHODOLOGY?

A. No. The allocation process was set based on a Removal Cost Study performed in 2018 and has been consistent since that time. These same allocations were used to set net salvage factors in the last depreciation study. The Removal Cost Study results were reevaluated as part of this study and found to be materially the same as found in the previous study. The increases in removal cost are primarily due to increases in the cost of construction and removal activity through time.

Q. HOW DID YOU DETERMINE THE NET SALVAGE PERCENTAGE FOR EACH ACCOUNT?

A. I examined the experience realized by the Company by observing the average net salvage for various bands (or combinations) of years. Using averages (such as the 5-year and 10-year average bands) allows the smoothing of the timing differences between when retirements, removal cost, and salvage are booked. By looking at successive average bands ("rolling bands"), an analyst can see trends in the data that would indicate the future net salvage in the account. This examination, in combination with the feedback of Company engineers related to any changes in operations or maintenance that would affect the future net salvage of the asset, allowed the selection of the best estimate of future net salvage for each account. The net salvage as a percentage of retirements for various bands (i.e., groupings of years such as the five-year average) for each account are shown in my Exhibit DAW-1, Appendix D. As with any analysis of this type, expert judgment was also applied in order to select a net salvage percentage reflective of the future expectations for each account.

Q. IS THIS A REASONABLE METHOD FOR DETERMINING NET SALVAGE RATES?

A. Yes. The method used to establish appropriate net salvage percentages for each account was determined by using the same methodology that was approved in prior cases before the Commission in Docket Nos. 38339 and 49421. It is also the methodology commonly employed before this Commission and throughout the industry and is the method recommended in authoritative texts on the topic of depreciation.[3]

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[3] See *Depreciation Systems*, by Drs. W. C. Fitch and F.K. Wolf, Iowa State Press, 1994, pp. 51-68 and 260-273; *Public Utility Depreciation Practices*, NARUC, 1996, pp. 157-164; or *Introduction to Depreciation and Net Salvage*, EEI AGA, 2013, pp. 75-100.

Q. CAN YOU ELABORATE FURTHER ON YOUR RECOMMENDED CHANGES TO THE COMPANY'S CURRENT NET SALVAGE RATIOS?

A. Yes. The primary reason for the significant change in net salvage rates is that the Company has experienced a significant increase in removal cost for Transmission and Distribution functions while gross salvage proceeds have declined for those functions. For Transmission, Distribution, and General Property, there has been only one account with increases (more positive/less negative) in net salvage and 13 accounts with decreases (less positive/more negative) in net salvage, while the remaining 20 accounts were unchanged. Figure 2 below provides the approved and proposed net salvage percentages for each account. More detail can be found in the Salvage Analysis section of my depreciation study in Exhibit DAW-1 and in Appendix D of Exhibit DAW-1, as well as in my workpapers.

Figure 2

Account	Description	Approved Net Salvage	Proposed Net Salvage
E30302	Software 3 year	NA	0%
E30302	Software 5 year	0%	0%
E30302	Software 7 year	0%	0%
E30302	Software 10 year	0%	0%
E30302	Software 15 year	0%	0%
E35002	Land Rights	0%	0%
E35201	Structures. & Improvements	-5%	-5%
E35301	Station Equipment	-10%	-15%
E35401	Towers & Fixtures	-30%	-40%
E35501	Poles and Fixtures	-50%	-60%
E35601	O/H Conduct/Devices	-100%	-100%
E35701	Underground Conduit	-5%	-5%
E35801	U/G Conduct/Devices	-5%	-5%
E35901	Roads and Trails	0%	0%
E36002	Land Rights	0%	0%
E36101	Structures & Improvements	-10%	-15%
E36201	Station Equipment	-10%	-15%

E36301	Battery Storage Equipment	0%	0%
E36401	Poles, Towers & Fixtures	-45%	-60%
E36501	O/H Conduct Devices	-30%	-40%
E36601	Underground Conduit	-30%	-35%
E36701	U/G Conduct/Devices	-35%	-45%
E36801	Line Transformers	-15%	-25%
E36901	Services	-60%	-60%
E37001	Meters	0%	0%
E37003	AMS Meters	0%	0%
E37301	Street Lighting/Signal Systems	-30%	-40%
E37401	Security Lighting	-30%	-40%
E38902	Land Rights	0%	0%
E39001	Structures. & Improvements	-5%	-5%
E39101	Office F/F	0%	0%
E39201	Transportation Equipment	10%	10%
E39301	Stores Equipment	0%	0%
E39401	Tools, Shop & Garage Equipment	0%	0%
E39501	Laboratory Equipment	0%	0%
E39601	Power Operated Equipment	6%	10%
E39701	Microwave Equipment	2%	0%
E39701.0130	Other Communication Equip	2%	0%
E39702	Computer Equipment	0%	0%
E39801	Miscellaneous. Equipment	0%	0%

Q. ARE YOUR RECOMMENDED NET SALVAGE RATIOS REASONABLE?

A. Yes.

IV. CONCLUSION

Q. PLEASE SUMMARIZE THE CONCLUSIONS YOU HAVE REACHED AS A RESULT OF YOUR ANALYSIS.

A. The depreciation study and analysis performed under my supervision fully support setting depreciation rates for CenterPoint Houston at the level I have indicated in my testimony and exhibits. The depreciation study describes the extensive analysis performed and the resulting rates are reasonable and appropriate for its respective property classes. CenterPoint Houston's depreciation rates should be set at my recommended amounts in order to recover the Company's total investment in property over the estimated remaining life of the assets.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes.

Asset Location	Commission	Docket No. (if applicable)	Company	Year	Description
Missouri	Missouri Public Service Commission	GR-2024-0106	Liberty Utilities Mid States Gas	2024	Gas Depreciation Study
Pennsylvania	Pennsylvnia Public Utility Commission	R-2024-3045193	Veolia Pennsylvania	2024	WasteWater Depreciation Study
Pennsylvania	Pennsylvnia Public Utility Commission	R-2024-3045192	Veolia Pennsylvania	2024	Water Depreciation Study
Arkansas	Arkansas Public Service Commission	23-079-U	Summit Utilities Arkansas	2024	Gas Depreciation Study
Colorado	Colorado Public Utilities Commission	23A-0632G	Atmos Energy	2023	Gas Clean Heat Plan
Oklahoma	Oklahoma Corporation Commission	2023-00087	Oklahoma Gas & Electric	2023	Electric Depreciation Study
Illinois	Illinois Commerce Commission	24-0043	Liberty Mid States Gas-Illinois	2023	Gas Depreciation Study
Michigan	Michigan Public Service Commission	U-21513	Upper Peninsula Power Company	2023	Electric Depreciation Study
Texas	Public Utility Commission of Texas	55867	Lower Colorado River Authority	2023	Electric Depreciation Study
Texas	Railroad Commission of Texas	Case No. OS-23-00015513	CenterPoint Texas Gas	2023	Gas Depreciation Study
Nevada	Public Utility Commission of Nevada	23-090-12	Southwest Gas	2023	Gas Depreciation Study - Nevada Division
Louisiana	Public Service Commission of Louisiana	36959	Entergy Louisiana	2023	Electric Depreciation Study
Texas	Railroad Commission of Texas	13758	Atmos Energy - APT	2023	Gas Depreciation Study
Florida	Florida Public Service Commission	20230023	People Gas System	2023	Gas Depreciation Study
Texas	Public Utility Commission of Texas	54565	Central States Water Resources (CSWR Texas)	2023	Water Depreciation Study
Louisiana	Louisiana Public Service Commission	U-36923	Cleco	2023	Electric Depreciation study
New York	New York State Public Service Commission	23-W-0111	Veolia New York	2023	Water Depreciation Study
Arkansas	Arkansas Public Service Commission	22-085-U	Empire District Electric Company	2023	Electric Depreciation Study
Alaska	Regulatory Commission of Alaska	TA50-733 (U-21-058)	Cook Inlet Natural Gas Storage Alaska	2023	Focused Study - Communication Equipment
Manitoba Canada	Manitoba Public Utilities Board		Manitoba Hydro Electric	2022	Electric Depreciation Study
Tennessee	Tennessee Public Utility Commission	20-00086	Piedmont Natural Gas	2022	Gas Depreciation Study - 3 State
Texas	Public Utility Commission of Texas	54634	Southwestern Public Service Company	2023	Electric Technical Update
Arkansas	Arkansas Public Service Commission	22-085-U	Liberty Empire Electric Arkansas	2023	Electric Depreciation Study
Florida	Florida Public Service Commission	20220219	People Gas System	2022	Gas Depreciation Study
Michigan	Michigan Public Service Commission	U-21329	Michigan Gas Utilities Corporation	2022	Gas Depreciation Study
Dominica	Independent Regulatory Commission		Dominica Electricity Services LTD	2022	Electric Depreciation Study
New Mexico	New Mexico Public Regulation Commission	22-00270-UT	Public Service of New Mexico	2022	Electric Depreciation Study
New Mexico	New Mexico Public Regulation Commission	22-00286-UT	Southwestern Public Service Company	2022	Electric Technical Update

Asset Location	Commission	Docket No. (if applicable)	Company	Year	Description
Minnesota	Minnesota Public Utilities Commission	22-299	Northern States Power-Minnesota	2022	Electric Gas and Common Depreciation Study
California	California Public Utilities Commission	A.22-08-010	Bear Valley Electric	2022	Electric Depreciation Study
Michigan	Michigan Public Service Commission	U-21294	SEMCO Gas	2022	Gas Depreciation Study
Arkansas	Arkansas Public Service Commission	22-064-U	Liberty Pine Bluff Water	2022	Water Depreciation Study
Colorado	Colorado Public Utilities Commission	22AL-0348G	Atmos Energy	**2022**	**Gas Depreciation Study**
New York	FERC	ER22-2581-000	New York Power Authority	2022	Transmission and General Depreciation Study
South Carolina	South Carolina Public Service Commission	2022-89-G	Piedmont Natural Gas	2022	Natural Gas Depreciation Study
California	California Public Utilities Commission	A.22-007-001	California American Water	2022	Water and Waste Water Depreciation Study
Alaska	Regulatory Commission of Alaska	U-22-034	Chugach Electric Association	2022	Electric Depreciation Study
Georgia	Georgia Public Service Commission	44280	Georgia Power Company	2022	Electric Depreciation Study
Texas	Public Utility Commission of Texas	53719	Entergy Texas	2022	Electric Depreciation Study
California	California Public Utilities Commission	22-005-xxx	San Diego Gas and Electric	2022	Electric Gas and Common Depreciation Study
California	California Public Utilities Commission	22-005-xxx	Southern California Gas	2022	Gas Depreciation Study
Colorado	Colorado Public Utilities Commission	22AL-0046G	Public Service of Colorado	2022	Gas Depreciation given potential for climate change
Texas	Public Utility Commission of Texas	53601	Oncor Electric Delivery	2022	Electric Depreciation Study
New Jersey	New Jersey Board of Public Utilities	GR2222040253	South Jersey Gas	2022	Gas Depreciation Study
Oklahoma	Corporation Commission of Oklahoma	PUD 202100163	Empire District Electric Company	2022	Electric Depreciation Study
Michigan	Michigan Public Service Commission	U-21176	Consumers Gas	2021	Gas Depreciation Study
New Jersey	New Jersey Board of Public Utilities	GR21121254	Elizabethtown Natural Gas	2021	Gas Depreciation Study
Ontario Canada	Ontario Energy Board	EB-2021-0110	Hydro One	2021	Electric Depreciation Study
Alaska	Regulatory Commission of Alaska	TA116-118, TA115-97, TA160-37 and TA110-290	Fairbanks Water and Wastewater	2021	Water and Waste Water Depreciation Study
Colorado	Public Utilities Commission of Colorado	21AL-0317E	Public Service of Colorado	2021	Electric and Common Depreciation Study
Alaska	Regulatory Commission of Alaska	U-21-025	Golden Valley Electric Association	2021	Electric Depreciation Study
Wisconsin	Public Service Commission of Wisconsin	5-DU-103	WE Energies	2021	Electric and Gas Depreciation Study
Kentucky	Public Service Commission of Kentucky	2021-00214	Atmos Kentucky	2021	Gas Depreciation Study
Missouri	Missouri Public Service Commission	ER-2021-0312	Empire District Electric Company	2021	Electric Depreciation Study
Wisconsin	Public Service Commission of Wisconsin	4220-DU-111	Northern States Power Wisconsin	2021	Transmission, Distribution General and Common Depreciation Study

Asset Location	Commission	Docket No. (if applicable)	Company	Year	Description
Louisiana	Louisiana Public Service Commission	U-35951	Atmos Energy	2021	Statewide Gas Depreciation Study
Minnesota	Minnesota Public Utilities Commission	E015-D-21-229	Allete Minnesota Power	2021	Intangible, Transmission, Distribution, and General Depreciation Study
Michigan	Michigan Public Service Commission	U-20849	Consumers Energy	2021	Electric and Common Depreciation Study
Texas	Texas Public Utility Commission	51802	Southwestern Public Service Company	2021	Electric Technical Update
MultiState	FERC	RP21-441-000	Florida Gas Transmission	2021	Gas Depreciation Study
New Mexico	New Mexico Public Regulation Commission	20-00238-UT	Southwestern Public Service Company	2021	Electric Technical Update
Yukon Territory Canada	Yukon Energy Board	2021 General Rate Application	Yukon Energy	2020	Electric Depreciation Study
MultiState	FERC	ER21-709-000	American Transmission Company	2020	Electric Depreciation Study
Texas	Texas Public Utility Commission	51611	Sharyland Utilities	2020	Electric Depreciation Study
Texas	Texas Public Utility Commission	51536	Brownsville Public Utilities Board	2020	Electric Depreciation Study
New Jersey	New Jersey Board of Public Utilities	WR20110729	Suez Water New Jersey	2020	Water and Waste Water Depreciation Study
Idaho	Idaho Public Service Commission	SUZ-W-20-02	Suez Water Idaho	2020	Water Depreciation Study
Texas	Texas Public Utility Commission	50944	Monarch Utilities	2020	Water and Waste Water Depreciation Study
Michigan	Michigan Public Service Commission	U-20844	Consumers Energy/DTE Electric	2020	Ludington Pumped Storage Depreciation Study
Mexico	Comision Reguladora de Energia	G/352/TRA/2015 UH-250/125738/2019	Arguelles Depreciation Study	2020	Gas Depreciation Study
Tennessee	Tennessee Public Utility Commission	2000086	Piedmont Natural Gas	2020	Gas Depreciation Study
Texas	Railroad Commission of Texas	OS-00005136	CoServ Gas	2020	Gas Depreciation Study
Texas	Railroad Commission of Texas	GUD 10988	EPCOR Gas Texas	2020	Gas Depreciation Study
Florida	Florida Public Service Commission	20200166-GU	People Gas System	2020	Gas Depreciation Study
Mississippi	Federal Energy Regulatory Commission	ER20-1660-000	Mississippi Power Company	2020	Electric Depreciation Study
Texas	Public Utility Commission of Texas	50557	Corix Utilities	2020	Water and Waste Water Depreciation Study
Georgia	Georgia Public Service Commission	42959	Liberty Utilities Peach State Natural Gas	2020	Gas Depreciation Study
Texas	Public Utility Commission of Texas	50734	Oncor Electric Delivery	2020	Life of Intangible Plant
New Jersey	New Jersey Board of Public Utilities	GR20030243	South Jersey Gas	2020	Gas Depreciation Study
Kentucky	Kentucky Public Service Commission	2020-00064	Big Rivers	2020	Electric Depreciation Study
Colorado	Colorado Public Utilities Commission	20AL-0049G	Public Service of Colorado	2020	Gas Depreciation Study
Texas	NA	NA	Pedernales Electric Coop	2019	Electric Depreciation Study

Asset Location	Commission	Docket No. (if applicable)	Company	Year	Description
New York	Federal Energy Regulatory Commission	ER20-716-000	LS Power Grid New York, Corp.	2019	Electric Transmission Depreciation Study
Mississippi	Mississippi Public Service Commission	2019-UN-219	Mississippi Power Company	2019	Electric Depreciation Study
Texas	Public Utility Commission of Texas	50288	Kerrville Public Utility District	2019	Electric Depreciation Study
Texas	Railroad Commission of Texas	GUD 10920	CenterPoint Gas	2019	Gas Depreciation Study and Propane Air Study
Texas, New Mexico	Federal Energy Regulatory Commission	ER20-277-000	Southwestern Public Service Company	2019	Electric Production and General Plant Depreciation Study
New Mexico	New Mexico Public Regulation Commission		New Mexico Gas	2019	Gas Depreciation Study
Alaska	Regulatory Commission of Alaska	U-19-086	Alaska Electric Light and Power	2019	Electric Depreciation Study
Texas	Railroad Commission of Texas	GUD 10900	Atmos Energy West Texas Division - Triangle	2019	Depreciation Rates for Natural Gas Property
Delaware	Delaware Public Service Commission	19-0615	Suez Water Delaware	2019	Water Depreciation Study
California	California Public Utilities Commission	A.19-08-015	Southwest Gas Northern California	2019	Gas Depreciation Study
California	California Public Utilities Commission	A.19-08-015	Southwest Gas Southern California	2019	Gas Depreciation Study
Texas	Railroad Commission of Texas	GUD 10895	CenterPoint Propane Air	2019	Depreciation Rates for Propane Air Assets
Texas	Public Utility Commission of Texas	49831	Southwestern Public Service Company	2019	Electric Depreciation Study
New Mexico	New Mexico Public Regulation Commission	19-00170-UT	Southwestern Public Service Company	2019	Electric Depreciation Study
Georgia	Georgia Public Service Commission	42516	Georgia Power Company	2019	Electric Depreciation Study
Georgia	Georgia Public Service Commission	42315	Atlanta Gas Light	2019	Gas Depreciation Study
Arizona	Arizona Corporation Commission	G-01551A-19-0055	Southwest Gas Corporation	2019	Gas Removal Cost Study
New Hampshire	New Hampshire Public Service Commission	DE 19-064	Liberty Utilities	2019	Electric Distribution and General
New Jersey	New Jersey Board of Public Utilities	GR19040486	Elizabethtown Natural Gas	2019	Gas Depreciation Study
Texas	Public Utility Commission of Texas	49421	CenterPoint Houston Electric LLC	2019	Electric Depreciation Study
North Carolina	North Carolina Utilities Commission	Docket No. G-9, Sub 743	Piedmont Natural Gas	2019	Gas Depreciation Study
Minnesota	Minnesota Public Utilities Commission	E-015/D-18-226	Allete Minnesota Power	2018	Electric Compliance Filing
Colorado	Colorado Public Utilities Commission	19AL-0063ST	Public Service of Colorado	2019	Steam Depreciation Study
Texas	NA	NA	CenterPoint Texas	2019	Propane Air Depreciation Study
Various	NA	NA	Enable Midstream Partners	2019	Gas Depreciation Study
Alaska	Regulatory Commission of Alaska	U-18-121	Municipal Power and Light City of Anchorage	2018	Electric Depreciation Study

Asset Location	Commission	Docket No. (if applicable)	Company	Year	Description
Various	NA	NA	Pattern Energy	2018	Renewable Asset Capital Accounting
New York	NA	NA	Long Island Electric Utility Servco LLC	2018	Electric Depreciation Study
Various	FERC	RP19-352-000	Sea Robin	2018	Gas Depreciation Study
Texas New Mexico	Federal Energy Regulatory Commission	ER19-404-000	Southwestern Public Service Company	2018	Electric Transmission Depreciation Study
California	Federal Energy Regulatory Commission	ER19-221-000	San Diego Gas and Electric	2018	Electric Transmission Depreciation Study
Kentucky	Kentucky Public Service Commission	2018-00281	Atmos Kentucky	2018	Gas Depreciation Study
Texas	Public Utility Commission of Texas	48500	Golden Spread Electric Coop	2018	Electric Depreciation Study
Alaska	Regulatory Commission of Alaska	U-18-054	Matanuska Electric Coop	2018	Electric Generation Depreciation Study
California	California Public Utilities Commission	A17-10-007	San Diego Gas and Electric	2018	Electric and Gas Depreciation Study
Texas	NA	NA	Lower Colorado River Authority	2018	Electric Transmission and General Study
Texas	Public Utility Commission of Texas	48401	Texas New Mexico Power	2018	Electric Depreciation Study
Nevada	Public Utility Commission of Nevada	18-05031	Southwest Gas	2018	Gas Depreciation Study
Texas	Public Utility Commission of Texas	48231	Oncor Electric Delivery	2018	Depreciation Rates
Texas	Public Utility Commission of Texas	48371	Entergy Texas	2018	Electric Depreciation Study
Kansas	Kansas Corporation Commission	18-KCPE-480-RTS	Kansas City Power and Light	2018	Electric Depreciation Study
Louisiana	Louisiana Public Service Commission	U-34803	Atmos LGS	2018	Gas Depreciation Study
Arkansas	Arkansas Public Service Commission	18-027-U	Liberty Pine Bluff Water	2018	Water Depreciation Study
Minnesota	Minnesota Public Utilities Commission	E-015/D-18-226	Allete Minnesota Power	2018	Electric Depreciation Rate
Kentucky	Kentucky Public Service Commission	2017-00349	Atmos KY	2018	Gas Depreciation Rates
Tennessee	Tennessee Public Utility Commission	18-00017	Chattanooga Gas	2018	Gas Depreciation Study
Texas	Railroad Commission of Texas	10679	Si Energy	2018	Gas Depreciation Study
Texas	City of Dallas Statement of Intent	NA	Atmos Mid-Tex	2017-2018	Gas Depreciation Study
Alaska	Regulatory Commission of Alaska	U-17-104	Anchorage Water and Wastewater	2017	Water and Waste Water Depreciation Study
Michigan	Michigan Public Service Commission	U-18488	Michigan Gas Utilities Corporation	2017	Gas Depreciation Study
New Mexico	FERC	ER18-228-000	Southwestern Public Service Company	2017	Electric Production Depreciation Study
Texas	Railroad Commission of Texas	10669	CenterPoint South Texas	2017	Gas Depreciation Study
New Mexico	New Mexico Public Regulation Commission	17-00255-UT	Southwestern Public Service Company	2017	Electric Production Depreciation Study
Arkansas	Arkansas Public Service Commission	17-061-U	Empire District Electric Company	2017	Depreciation Rates for New Wind Generation
Kansas	Kansas Corporation Commission	18-EPDE-184-PRE	Empire District Electric Company	2017	Depreciation Rates for New Wind Generation

Asset Location	Commission	Docket No. (if applicable)	Company	Year	Description
Oklahoma	Oklahoma Corporation Commission	PUD 201700471	Empire District Electric Company	2017	Depreciation Rates for New Wind Generation
Missouri	Missouri Public Service Commission	EO-2018-0092	Empire District Electric Company	2017	Depreciation Rates for New Wind Generation
Michigan	Michigan Public Service Commission	U-18457	Upper Peninsula Power Company	2017	Electric Depreciation Study
Florida	Florida Public Service Commission	20170179-GU	Florida City Gas	2017	Gas Depreciation Study
Iowa	NA		Cedar Falls Utility	2017	Telecommunications, Water, and Cable Utility
Michigan	FERC	ER18-56-000	Consumers Energy	2017	Electric Depreciation Study
Missouri	Missouri Public Service Commission	GR-2018-0013	Liberty Utilities	2017	Gas Depreciation Study
Michigan	Michigan Public Service Commission	U-18452	SEMCO	2017	Gas Depreciation Study
Texas	Public Utility Commission of Texas	47527	Southwestern Public Service Company	2017	Electric Production Depreciation Study
Minnesota	Minnesota Public Utilities Commission	17-581	Minnesota Northern States Power	2017	Electric, Gas and Common Transmission, Distribution and General
Colorado	Colorado Public Utilities Commission	17AL-0363G	Public Service of Colorado-Gas	2017	Gas Depreciation Study
MultiState	FERC	ER17-1664	American Transmission Company	2017	Electric Depreciation Study
Alaska	Regulatory Commission of Alaska	U-17-008	Municipal Power and Light City of Anchorage	2017	Generating Unit Depreciation Study
Louisiana	Louisiana Public Service Commission	U-34343	Atmos Trans Louisiana	2017	Gas Depreciation Study
Mississippi	Mississippi Public Service Commission	2017-UN-041	Atmos Energy	2017	Gas Depreciation Study
New York	FERC	ER17-1010-000	New York Power Authority	2017	Electric Depreciation Study
Oklahoma	Oklahoma Corporation Commission	PUD 201700078	CenterPoint Oklahoma	2017	Gas Depreciation Study
Texas	Railroad Commission of Texas	GUD 10580	Atmos Pipeline Texas	2017	Gas Depreciation Study
Texas	Public Utility Commission of Texas	46957	Oncor Electric Delivery	2017	Electric Depreciation Study
Alabama	FERC	ER16-2312-000	Alabama Power Company	2016	Electric Depreciation Study
Alabama	FERC	ER16-2313-000	SEGCO	2016	Electric Depreciation Study
Alaska	Regulatory Commission of Alaska	U-16-067	Alaska Electric Light and Power	2016	Generating Unit Depreciation Study
Arizona	Arizona Corporation Commission	G-01551A-16-0107	Southwest Gas	2016	Gas Depreciation Study
California	California Public Utilities Commission	A 16-07-002	California American Water	2016	Water and Waste Water Depreciation Study
Colorado	Colorado Public Utilities Commission	16A-0231E	Public Service Company of Colorado	2016	Electric Depreciation Study
Mississippi	Mississippi Public Service Commission	2016 UN 267	Willmut Gas	2016	Gas Depreciation Study
Florida	Florida Public Service Commission	160170-EI	Gulf Power	2016	Electric Depreciation Study

Asset Location	Commission	Docket No. (if applicable)	Company	Year	Description
Georgia	N/A	N/A	Dalton Utilities	2016	Electric, Gas, Water, Wastewater & Fiber Depreciation Study
Georgia	NA	NA	Oglethorpe Power	2016	Electric Depreciation Study
Illinois	Illinois Commerce Commission	GRM #16-208	Liberty-Illinois	2016	Natural Gas Depreciation Study
Iowa	Iowa Utilities Board	RPU-2016-0003	Liberty-Iowa	2016	Natural Gas Depreciation Study
Kentucky	FERC	RP16-097-000	KOT	2016	Natural Gas Depreciation Study
Michigan	Michigan Public Service Commission	U-18195	Consumers Energy/DTE Electric	2016	Ludington Pumped Storage Depreciation Study
Michigan	Michigan Public Service Commission	U-18127	Consumers Energy	2016	Natural Gas Depreciation Study
MultiState	FERC	ER17-191-000	American Transmission Company	2016	Electric Depreciation Study
Hawaii			Hawaii American Water	2015	Wastewater and Water Depreciation Study
New Jersey	New Jersey Board of Public Utilities	GR16090826	Elizabethtown Natural Gas	2016	Gas Depreciation Study
New York	NA		New York Power Authority	2016	Electric Transmission and General Study
North Carolina	North Carolina Utilities Commission	Docket G-9 Sub 77H	Piedmont Natural Gas	2016	Gas Depreciation Study
Texas	Railroad Commission of Texas	GUD 10567	CenterPoint Texas	2016	Gas Depreciation Study
Texas	Public Utility Commission of Texas	45414	Sharyland	2016	Electric Depreciation Study
Alaska	Regulatory Commission of Alaska	U-15-089	Fairbanks Water and Wastewater	2015	Water and Waste Water Depreciation Study
Arkansas	Arkansas Public Service Commission	15-098-U	CenterPoint Arkansas	2015	Gas Depreciation Study and Cost of Removal Study
Arkansas	Arkansas Public Service Commission	15-031-U	Source Gas Arkansas	2015	Underground Storage Gas Depreciation Study
Hawaii			Hawaii American Water	2015	Wastewater and Water Depreciation Study
Arkansas	Arkansas Public Service Commission	15-011-U	Source Gas Arkansas	2015	Gas Depreciation Study
Atmos Energy Corporation	Tennessee Regulatory Authority	14-00146	Atmos Tennessee	2015	Natural Gas Depreciation Study
Colorado	Colorado Public Utilities Commission	15-AL-0299G	Atmos Colorado	2015	Gas Depreciation Study
Kansas	Kansas Corporation Commission	16-ATMG-079-RTS	Atmos Kansas	2015	Gas Depreciation Study
Kansas	Kansas Corporation Commission	15-KCPE-116-RTS	Kansas City Power and Light	2015	Electric Depreciation Study
Montana	NA	NA	Energy Keepers	2015	Property Units/ Depreciation Rates Hydro Facility
Multi-State NE US	FERC	16-453-000	Northeast Transmission Development, LLC	2015	Electric Depreciation Study
New Mexico	New Mexico Public Regulation Commission	15-00261-UT	Public Service Company of New Mexico	2015	Electric Depreciation Study

Asset Location	Commission	Docket No. (if applicable)	Company	Year	Description
New Mexico	New Mexico Public Regulation Commission	15-00296-UT	Southwestern Public Service Company	2015	Electric Depreciation Study
New Mexico	New Mexico Public Regulation Commission	15-00139-UT	Southwestern Public Service Company	2015	Electric Depreciation Study
Texas	Railroad Commission of Texas	GUD 10432	CenterPoint- Texas Coast Division	2015	Gas Depreciation Study
Texas	Public Utility Commission of Texas	44704	Entergy Texas	2015	Electric Depreciation Study
Texas	Public Utility Commission of Texas	44746	Wind Energy Transmission Texas	2015	Electric Depreciation Study
Texas, New Mexico	FERC	ER15-949-000	Southwestern Public Service Company	2015	Electric Depreciation Study
Alaska	Regulatory Commission of Alaska	U-14-120	Alaska Electric Light and Power	2014-2015	Electric Depreciation Study
Alabama	State of Alabama Public Service Commission	U-5115	Mobile Gas	2014	Gas Depreciation Study
Alaska	Regulatory Commission of Alaska	U-14-045	Matanuska Electric Coop	2014	Electric Generation Depreciation Study
Alaska	Regulatory Commission of Alaska	U-14-054	Sand Point Generating LLC	2014	Electric Depreciation Study
Alaska	Regulatory Commission of Alaska	U-14-055	TDX North Slope Generating	2014	Electric Depreciation Study
California	California Public Utilities Commission	A.14-07-006	Golden State Water	2014	Water and Waste Water Depreciation Study
Colorado	Public Utilities Commission of Colorado	14AL-0660E	Public Service Company of Colorado	2014	Electric Depreciation Study
Louisiana	Louisiana Public Service Commission	U-28814	Atmos Energy Corporation	2014	Gas Depreciation Study
Michigan	Michigan Public Service Commission	U-17653	Consumers Energy Company	2014	Electric and Common Depreciation Study
Multi State SE US	FERC	RP15-101	Florida Gas Transmission	2014	Gas Transmission Depreciation Study
Nebraska	Nebraska Public Service Commission	NG-0079	Source Gas Nebraska	2014	Gas Depreciation Study
New Mexico	New Mexico Public Regulation Commission	14-00332-UT	Public Service of New Mexico	2014	Electric Depreciation Study
Texas	Public Utility Commission of Texas	43950	Cross Texas Transmission	2014	Electric Depreciation Study
Texas	NA	NA	Hughes Natural Gas	2014	Gas Depreciation Study
Texas	Public Utility Commission of Texas	42469	Lone Star Transmission	2014	Electric Depreciation Study
Texas	Public Utility Commission of Texas	43695	Southwestern Public Service Company	2014	Electric Depreciation Study
Wisconsin	Wisconsin	05-DU-102	WE Energies	2014	Electric, Gas, Steam and Common Depreciation Studies
Texas, New Mexico	Public Utility Commission of Texas	42004	Southwestern Public Service Company	2013-2014	Electric Production, Transmission, Distribution and General Plant Depreciation Study
Virginia	Virginia Corporation Commission	PUE-2013-00124	Atmos Energy Corporation	2013-2014	Gas Depreciation Study
Arkansas	Arkansas Public Service Commission	13-078-U	Arkansas Oklahoma Gas	2013	Gas Depreciation Study

Asset Location	Commission	Docket No. (if applicable)	Company	Year	Description
Arkansas	Arkansas Public Service Commission	13-079-U	Source Gas Arkansas	2013	Gas Depreciation Study
California	California Public Utilities Commission	Proceeding No.: A.13-11-003	Southern California Edison	2013	Electric Depreciation Study
Kentucky	Kentucky Public Service Commission	2013-00148	Atmos Energy Corporation	2013	Gas Depreciation Study
Minnesota	Minnesota Public Utilities Commission	13-252	Allete Minnesota Power	2013	Electric Depreciation Study
New Hampshire	New Hampshire Public Service Commission	DE 13-063	Liberty Utilities	2013	Electric Distribution and General
New Jersey	New Jersey Board of Public Utilities	GR13111137	South Jersey Gas	2013	Gas Depreciation Study
North Carolina/South Carolina	FERC	ER13-1313	Progress Energy Carolina	2013	Electric Depreciation Study
Oklahoma and TX Panhandle	NA	NA	Enable Midstream Partners	2013	Gas Depreciation Study
Texas	Public Utility Commission of Texas	41474	Sharyland	2013	Electric Depreciation Study
Texas	Railroad Commission of Texas	10235	West Texas Gas	2013	Gas Depreciation Study
Various	FERC	RP14-247-000	Sea Robin	2013	Gas Depreciation Study
Wisconsin	Public Service Commission of Wisconsin	4220-DU-108	Northern States Power Company - Wisconsin	2013	Electric, Gas and Common Transmission, Distribution and General
Alaska	Regulatory Commission of Alaska	U-12-154	Alaska Telephone Company	2012	Telecommunications Utility
Alaska	Regulatory Commission of Alaska	U-12-141	Interior Telephone Company	2012	Telecommunications Utility
Alaska	Regulatory Commission of Alaska	U-12-149	Municipal Power and Light City of Anchorage	2012	Electric Depreciation Study
Colorado	Colorado Public Utilities Commission	12AL-1269ST	Public Service Company of Colorado	2012	Gas and Steam Depreciation Study
Colorado	Colorado Public Utilities Commission	12AL-1268G	Public Service Company of Colorado	2012	Gas and Steam Depreciation Study
Kansas	Kansas Corporation Commission	12-ATMG-564-RTS	Atmos Kansas	2012	Gas Depreciation Study
Kansas	Kansas Corporation Commission	12-KCPE-764-RTS	Kansas City Power and Light	2012	Electric Depreciation Study
Michigan	Michigan Public Service Commission	U-17104	Michigan Gas Utilities Corporation	2012	Gas Depreciation Study
Minnesota	Minnesota Public Utilities Commission	12-858	Northern States Power Company - Minnesota	2012	Electric, Gas and Common Transmission, Distribution and General
Nevada	Public Utility Commission of Nevada	12-04005	Southwest Gas	2012	Gas Depreciation Study
New Mexico	New Mexico Public Regulation Commission	12-00350-UT	Southwestern Public Service Company	2012	Electric Depreciation Study
North Carolina	North Carolina Utilities Commission	E-2 Sub 1025	Progress Energy Carolina	2012	Electric Depreciation Study
North Dakota	North Dakota Public Service Commission	PU-12-0813	Northern States Power	2012	Electric, Gas and Common Transmission, Distribution and General

Asset Location	Commission	Docket No. (if applicable)	Company	Year	Description
South Carolina	Public Service Commission of South Carolina	Docket 2012-384-E	Progress Energy Carolina	2012	Electric Depreciation Study
Texas	Railroad Commission of Texas	10170	Atmos Mid-Tex	2012	Gas Depreciation Study
Texas	Railroad Commission of Texas	10147, 10170	Atmos Mid-Tex	2012	Gas Depreciation Study
Texas	Railroad Commission of Texas	10174	Atmos West Texas	2012	Gas Depreciation Study
Texas	Railroad Commission of Texas	10182	CenterPoint Beaumont/ East Texas	2012	Gas Depreciation Study
Texas	Texas Public Utility Commission	40604	Cross Texas Transmission	2012	Electric Depreciation Study
Texas	Texas Public Utility Commission	40020	Lone Star Transmission	2012	Electric Depreciation Study
Texas	Texas Public Utility Commission	40606	Wind Energy Transmission Texas	2012	Electric Depreciation Study
Texas	Texas Public Utility Commission	40824	Xcel Energy	2012	Electric Depreciation Study
California	California Public Utilities Commission	A1011015	Southern California Edison	2011	Electric Depreciation Study
Colorado	Public Utilities Commission of Colorado	11AL-947E	Public Service Company of Colorado	2011	Electric Depreciation Study
Michigan	Michigan Public Service Commission	U-16938	Consumers Energy Company	2011	Gas Depreciation Study
Michigan	Michigan Public Service Commission	U-16536	Consumers Energy Company	2011	Wind Depreciation Rate Study
Mississippi	Mississippi Public Service Commission	2011-UN-184	Atmos Energy	2011	Gas Depreciation Study
MultiState	FERC	ER12-212	American Transmission Company	2011	Electric Depreciation Study
MultiState			Atmos Energy	2011	Shared Services Depreciation Study
MultiState			CenterPoint	2011	Shared Services Study
MultiState			CenterPoint	2011	Depreciation Reserve Study (SAP)
Pennsylvania	NA	NA	Safe Harbor	2011	Hydro Depreciation Study
Texas	Texas Public Utility Commission	39896	Entergy Texas	2011	Electric Depreciation Study
Texas	Public Utility Commission of Texas	38929	Oncor	2011	Electric Depreciation Study
Texas	Texas Commission on Environmental Quality	Matter 37050-R	Southwest Water Company	2011	WasteWater Depreciation Study
Texas	Texas Commission on Environmental Quality	Matter 37049-R	Southwest Water Company	2011	Water Depreciation Study
Alaska	Regulatory Commission of Alaska	U-10-070	Inside Passage Electric Cooperative	2010	Electric Depreciation Study
Georgia	Georgia Public Service Commission	31647	Atlanta Gas Light	2010	Gas Depreciation Study
Maine/ New Hampshire	FERC	10-896	Granite State Gas Transmission	2010	Gas Depreciation Study
Multi State – SE US	FERC	RP10-21-000	Florida Gas Transmission	2010	Gas Depreciation Study
Multistate	NA	NA	Constellation Energy	2010	Fossil Generation Depreciation Study
Multistate	NA	NA	Constellation Energy Nuclear	2010	Nuclear Generation Depreciation Study
Texas	Texas Railroad Commission	10041	Atmos Amarillo	2010	Gas Depreciation Study

Asset Location	Commission	Docket No. (if applicable)	Company	Year	Description
Texas	Texas Railroad Commission	10000	Atmos Pipeline Texas	2010	Gas Depreciation Study
Texas	Railroad Commission of Texas	10038	CenterPoint South TX	2010	Gas Depreciation Study
Texas	Public Utility Commission of Texas	36633	City Public Service of San Antonio	2010	Electric Depreciation Study
Texas	Public Utility Commission of Texas	38339	CenterPoint Electric	2010	Electric Depreciation Study
Texas	Public Utility Commission of Texas	38147	Southwestern Public Service Company	2010	Electric Technical Update
Texas	Public Utility Commission of Texas	38480	Texas New Mexico Power	2010	Electric Depreciation Study
Alaska	Regulatory Commission of Alaska	U-09-015	Alaska Electric Light and Power	2009-2010	Electric Depreciation Study
Alaska	Regulatory Commission of Alaska	U-10-043	Utility Services of Alaska	2009-2010	Water Depreciation Study
California	California Public Utility Commission	A10071007	California American Water	2009-2010	Water and Waste Water Depreciation Study
Michigan	Michigan Public Service Commission	U-16054	Consumers Energy	2009-2010	Electric Depreciation Study
Michigan	Michigan Public Service Commission	U-16055	Consumers Energy/DTE Energy	2009-2010	Ludington Pumped Storage Depreciation Study
Wyoming	Wyoming Public Service Commission	30022-148-GR10	Source Gas	2009-2010	Gas Depreciation Study
Colorado	Colorado Public Utilities Commission	09AL-299E	Public Service of Colorado	2009	Electric Depreciation Study
Iowa	NA		Cedar Falls Utility	2009	Telecommunications, Water, and Cable Utility
Michigan	Michigan Public Service Commission	U-15963	Michigan Gas Utilities Corporation	2009	Gas Depreciation Study
Michigan	Michigan Public Service Commission	U-15989	Upper Peninsula Power Company	2009	Electric Depreciation Study
Michigan	Michigan Public Service Commission	In Progress	Edison Sault	2009	Electric Depreciation Study
Mississippi	Mississippi Public Service Commission	09-UN-334	CenterPoint Energy Mississippi	2009	Gas Depreciation Study
New York	New York Public Service Commission		Key Span	2009	Generation Depreciation Study
North Carolina	North Carolina Utilities Commission		Piedmont Natural Gas	2009	Gas Depreciation Study
South Carolina	Public Service Commission of South Carolina		Piedmont Natural Gas	2009	Gas Depreciation Study
Tennessee	Tennessee Regulatory Authority	09-000183	AGL – Chattanooga Gas	2009	Gas Depreciation Study
Tennessee	Tennessee Regulatory Authority	11-00144	Piedmont Natural Gas	2009	Gas Depreciation Study
Texas	Railroad Commission of Texas	9869	Atmos Energy	2009	Shared Services Depreciation Study
Texas	Railroad Commission of Texas	9902	CenterPoint Energy Houston	2009	Gas Depreciation Study
Arizona	NA	NA	Arizona Public Service	2008	Fixed Asset Consulting
Louisiana	Louisiana Public Service Commission	U-30689	Cleco	2008	Electric Depreciation Study
Multiple States	NA	NA	Constellation Energy	2008	Generation Depreciation Study
New Mexico	New Mexico Public Regulation Commission	07-00319-UT	Southwestern Public Service Company	2008	Testimony Depreciation

Asset Location	Commission	Docket No. (if applicable)	Company	Year	Description
North Dakota	North Dakota Public Service Commission	PU-07-776	Northern States Power Company - Minnesota	2008	Net Salvage
Texas	Public Utility Commission of Texas	35717	Oncor	2008	Electric Depreciation Study
Texas	Public Utility Commission of Texas	35763	Southwestern Public Service Company	2008	Electric Production, Transmission, Distribution and General Plant Depreciation Study
Wisconsin	Wisconsin	05-DU-101	WE Energies	2008	Electric, Gas, Steam and Common Depreciation Studies
Colorado	Colorado Public Utilities Commission	Filed – no docket to date	Public Service Company of Colorado	2007-2008	Electric Depreciation Study
Colorado	Colorado Public Utilities Commission	10AL-963G	Public Service Company of Colorado	2007-2008	Gas Depreciation Study
Minnesota	Minnesota Public Utilities Commission	E015/D-08-422	Minnesota Power	2007-2008	Electric Depreciation Study
Multiple States	Railroad Commission of Texas	9762	Atmos Energy	2007-2008	Shared Services Depreciation Study
Multiple States	None		Tennessee Valley Authority	2007-2008	Electric Generation and Transmission Depreciation Study
Michigan	Michigan Public Service Commission	U-15629	Consumers Energy	2006-2009	Gas Depreciation Study
Multiple States	NA	NA	Constellation Energy	2007	Generation Depreciation Study
Texas	Public Utility Commission of Texas	34040	Oncor	2007	Electric Depreciation Study
Arkansas	Arkansas Public Service Commission	06-161-U	CenterPoint Energy Arkla Gas	2006	Gas Distribution Depreciation Study and Removal Cost Study
Colorado	Colorado Public Utilities Commission	06-234-EG	Public Service Company of Colorado	2006	Electric Depreciation Study
Multiple States	Multiple	NA	CenterPoint Energy	2006	Shared Services Depreciation Study
Nevada	NA	NA	Nevada Power/Sierra Pacific	2006	ARO Consulting
Pennsylvania	NA	NA	Safe Harbor	2006	Hydro Depreciation Study
Utah, Nevada, California	NA	NA	Intermountain Power Authority	2006	Generation Depreciation Study
Texas	Railroad Commission of Texas	9670/9676	Atmos Energy Corp	2005-2006	Gas Distribution Depreciation Study
Texas, New Mexico	Public Utility Commission of Texas	32766	Southwestern Public Service Company	2005-2006	Electric Production, Transmission. Distribution and General Plant Depreciation Study
Texas	Railroad Commission of Texas	9400	TXU Gas	2003-2004	Gas Distribution Depreciation Study
Texas	Railroad Commission of Texas	9313	TXU Gas	2002	Gas Distribution Depreciation Study
Texas	Railroad Commission of Texas	9225	TXU Gas	2002	Gas Distribution Depreciation Study

Asset Location	Commission	Docket No. (if applicable)	Company	Year	Description
Texas	Public Utility Commission of Texas	24060	TXU	2001	Line Losses
Texas	Public Utility Commission of Texas	23640	TXU	2001	Line Losses
Texas	Public Utility Commission of Texas	22350	TXU	2000-2001	Electric Depreciation Study, Unbundling
Texas	Railroad Commission of Texas	9145-9148	TXU Gas	2000-2001	Gas Distribution Depreciation Study
Texas	Public Utility Commission of Texas	20285	TXU	1999	Fuel Company Depreciation Study
Texas	Railroad Commission of Texas	8976	TXU Pipeline	1999	Pipeline Depreciation Study
Texas	Public Utility Commission of Texas	18490	TXU	1998	Transition to Competition
Texas	Public Utility Commission of Texas	16650	TXU	1997	Customer Complaint
Texas	Public Utility Commission of Texas	15195	TXU	1996	Mining Company Depreciation Study
Texas	Public Utility Commission of Texas	12160	TXU	1993	Fuel Company Depreciation Study
Texas	Public Utility Commission of Texas	11735	TXU	1993	Electric Depreciation Study

The following files are not convertible:

Appendix A.xlsx
Appendix A-1.xlsx
Appendix B.xlsx
Appendix C.xlsx
Appendix D.xlsx
Appendix E.xlsx
Appendix E-1.xlsx
Appendix E-2.xlsx
Appendix E-3.xlsx
Appendix E-4.xlsx

Please see the ZIP file for this Filing on the PUC Interchange in order to access these files.

Contact centralrecords@puc.texas.gov if you have any questions.

CenterPoint Energy
Houston Electric, LLC

Book Depreciation Accrual
Rate Study
At December 31, 2022

ALLIANCE
CONSULTING GROUP

CENTERPOINT ENERGY HOUSTON ELECTRIC, LLC
ELECTRIC UTILITY PLANT

DEPRECIATION RATE STUDY
EXECUTIVE SUMMARY

CenterPoint Energy Houston Electric, LLC ("CenterPoint Houston" or "Company") engaged Alliance Consulting Group to conduct a depreciation study of the Company's Electric Intangible, Transmission, Distribution, and General utility plant depreciable assets as of December 31, 2022. To estimate lives of these assets in the future, the most recent data was analyzed and operational input was sought from Company subject matter experts.

Overall, including intangible plant, this study recommends an increase of approximately $35.7 million. For intangible assets this study recommends an increase of approximately $0.5 million in annual depreciation and amortization expense. For transmission, distribution, and general assets, this study recommends an overall increase of approximately $35.2 million in annual depreciation and amortization expense for all accounts compared to the depreciation rates currently in effect. More specifically, the proposed depreciation accrual amounts consist of an increase of approximately $0.5 million in annual amortization expense for Intangible assets, an increase of $10.1 million in annual depreciation expense for Transmission assets, an increase of $21.9 million in Distribution assets, an increase of $2.8 million in General Depreciated assets, an increase of $0.2 million for General Amortized assets, and no change for the amortization amount for the difference between the book and theoretical reserves. Appendix B demonstrates the change in depreciation expense for the accounts.

The change in annual depreciation and amortization expense is largely driven by the fact that this depreciation study updates accrual rates for CenterPoint Houston based on a study at year end 2017. Since that time, the Company has experienced both a lengthening of lives and increasing levels of negative net salvage. With respect to service lives, this depreciation study recommends an increase in lives for many Transmission, Distribution, and General Plant accounts. Specifically, there are 13 accounts with increasing lives, five accounts with decreasing lives, and 16 accounts where the lives remained unchanged. The accounts with the greatest increase in life are Account 357 Underground Conduit and Account 370.01 Meters with increases of 15 and 19 years respectively. The Account with the greatest decrease of 14 years occurs in Account 397.01.0130, which reflects shorter lived assets in a new subaccount. This depreciation study also documents the trend toward more negative net salvage. In recognition of this fact, the depreciation study concludes that the net salvage rate should be decreased (i.e., made more negative) in 13 accounts, increased (i.e., made less negative) in one account, and that 20 accounts should remain unchanged with respect to net salvage rates. A more detailed discussion of these changes can be found in the life and net salvage analysis sections of this report.

CENTERPOINT ENERGY HOUSTON ELECTRIC, LLC
DEPRECIATION RATE STUDY
AT DECEMBER 31, 2022

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PURPOSE

The purpose of this study is to develop depreciation and amortization rates for the amortized intangible and depreciable transmission, distribution, and general property as recorded on the books of CenterPoint Houston as of December 31, 2022. The depreciation rates are designed to recover the total remaining undepreciated investment, adjusted for net salvage, over the remaining life of CenterPoint Houston's property on a straight-line basis. Non-depreciable assets were excluded from this study.

CenterPoint Houston is a regulated electric transmission and distribution company principally engaged in providing delivery to approximately 2.5 million customers around the Houston area. CenterPoint Houston provides the essential service of delivering electricity safely and reliably to end-use consumers through its distribution systems, as well as providing transmission grid connections to merchant power plants and interconnection to other transmission grids in Texas.

STUDY RESULTS

Recommended depreciation and amortization rates for the fixed assets operated by CenterPoint Houston are shown in Appendix A and Appendix B. These rates translate into an annual accrual for total plant, including intangible assets, of $558.1 million. This breaks down to: $50.5 million from intangible assets and $507.6 million from Transmission, Distribution and General plant. These accruals are based on CenterPoint Houston's depreciable investment at December 31, 2022. The proposed lives and curves on which these calculations are based are shown in Appendix C and the remaining lives based on these parameters are shown in Appendix A. Also shown in Appendix A-1 are the calculations of Vintage Group amortization rates for General plant. The annual depreciation expense for Intangible, Transmission, Distribution, and General plant, calculated using the same December 31, 2022 depreciable balances but using the existing approved depreciation rates, is approximately $522.4 million, as shown in Appendix B. Appendix C shows the effect of the change in lives and curves on depreciation accrual by account. Appendix D addresses the development of net salvage parameters for all plant accounts. Appendices E-1 through E-4 show the computation of remaining life and theoretical reserve for each account and depreciation reserve reallocation between each functional group of plant.

Consistent with Federal Energy Regulatory Commission ("FERC") Rule AR-15, this depreciation study continues the approved process of Vintaged Group Amortization in Accounts 391 through 398 (excluding Accounts 392 and 396). This process provides for the amortization of general plant over the same life as recommended in this study (with a separate amortization to allocate deficit or excess reserve). At the end of the amortized life, property will be retired from the books. Implementation of this approach did not affect the annual expense accrued by CenterPoint Houston and provides for the timely retirement of assets and the simplification of accounting for general property. Both the FERC and the Public Utility Commission of Texas ("PUCT") have approved this approach. The increased expense in General Amortized Plant is due to the recognition of changes in lives, not the continued use of Vintaged Group Amortization, as shown in Appendix E-4. A summary of the existing and proposed annual accrual rates is listed below.

CenterPoint Houston
Current and Requested Depreciation Rates

	Description	Existing Accrual Rate	Proposed Accrual Rate
	Intangible Plant		
303	Software 3 Year Life	NA	33.33%
303	Software 5 Year Life	20.00%	20.00%
303	Software 7 Year Life	14.29%	14.29%
303	Software 10 Year Life	10.00%	10.00%
303	Software 15 Year Life	6.67%	6.67%
	Transmission Plant		
350	Land Rights	1.31%	1.37%
352	Structures and Improvements	1.74%	1.77%
353	Station Equipment	2.05%	2.19%
354	Towers and Fixtures	2.15%	2.41%
355	Poles and Fixtures	2.47%	2.74%
356	Overhead Conductors and Devices	3.21%	3.44%
357	Underground Conduit	1.73%	1.46%
358	Underground Conductors and Devices	2.35%	2.58%
359	Roads and Trails	1.90%	2.25%
	Distribution Plant (Excluding Meters)		
360	Land Rights	1.55%	1.41%
361	Structures and Improvements	1.68%	1.86%
362	Station Equipment	2.14%	2.28%
363	Battery Storage Equipment	10.00%	10.00%
364	Poles, Towers and Fixtures	3.84%	4.21%
365	Overhead Conductors and Devices	3.24%	3.72%
366	Underground Conduits	1.96%	2.05%
367	Underground Conductors and Devices	3.34%	3.45%
368	Line Transformers	3.71%	4.16%
369	Services	3.76%	2.89%
370	Meters	3.32%	2.14%

370.3	Smart Meters	4.77%	4.47%
373 & 374	Street Lighting and Signal Systems	3.09%	3.45%
	General Plant (Excluding General Plant Amortized)		
389	Land Rights	1.80%	1.77%
390	Structures and Improvements	2.05%	1.73%
392	Transportation Equipment	6.73%	5.96%
396	Power Equipment	5.10%	6.03%
39701	Microwave Equipment	5.08%	5.17%
39701.0130	Other Communication Equipment	5.08%	8.75%
	General Plant Amortized		
391	Office Furniture and Equipment	4.17%	4.17%
393	Stores Equipment	5.26%	5.26%
394	Tools, Shop, Garage Equipment	5.56%	5.56%
395	Lab Equipment	4.00%	5.00%
39702	Computer Equipment	12.50%	12.50%
39801	Miscellaneous Equipment	5.00%	5.00%

GENERAL DISCUSSION

Definition

The term "depreciation" as used in this study is considered in the accounting sense; that is, a system of accounting that distributes the cost of assets, less net salvage (if any), over the estimated useful life of the assets in a systematic and rational manner. It is a process of allocation, not valuation. This expense is systematically allocated to accounting periods over the life of the properties. The amount allocated to any one accounting period does not necessarily represent the loss or decrease in value that will occur during that particular period. The Company accrues depreciation on the basis of the original cost of all depreciable property included in each functional property group. At retirement, the full cost of depreciable property, less the net salvage value, is charged to the depreciation reserve.

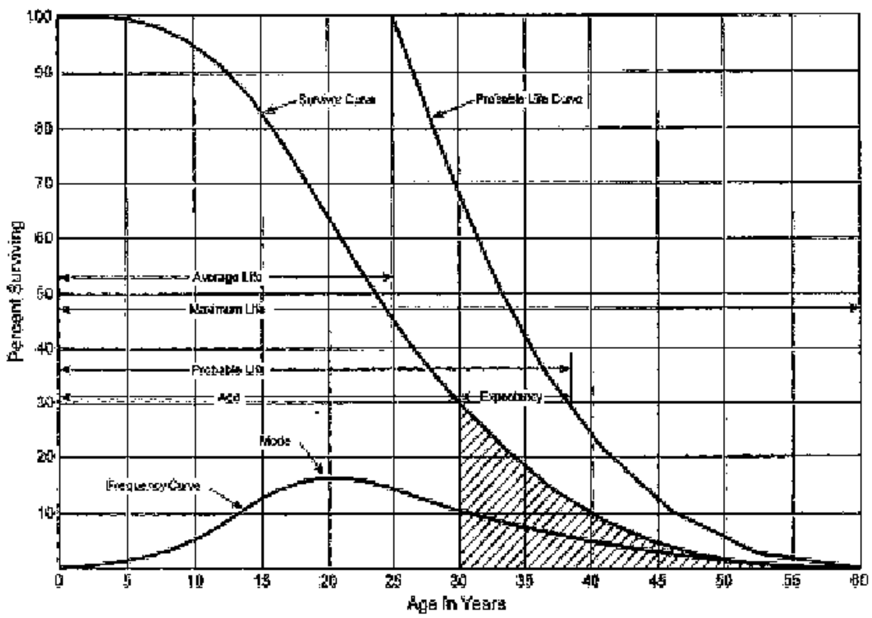
Basis of Depreciation Estimates

Annual and accrued depreciation were calculated in this study by the straight-line, broad group, remaining-life depreciation system. In this system, the annual depreciation expense for each group is computed by dividing the original cost of the asset group (less allocated depreciation reserve less estimated net salvage) by its respective average remaining life. The resulting annual accrual amounts were divided by the original cost of the depreciable property in each account to determine the depreciation rate. The calculated remaining lives and annual depreciation accrual rates were based on attained ages of plant in service and the estimated service life and salvage characteristics of each depreciable group, and were computed in a direct weighting by multiplying each vintage or account balance times its remaining life and dividing by the plant investment in service at December 31, 2022. The computations of the annual depreciation and amortization rates are shown in Appendix A, and the weighted remaining life calculations are shown in Appendices E-1 to E-4.

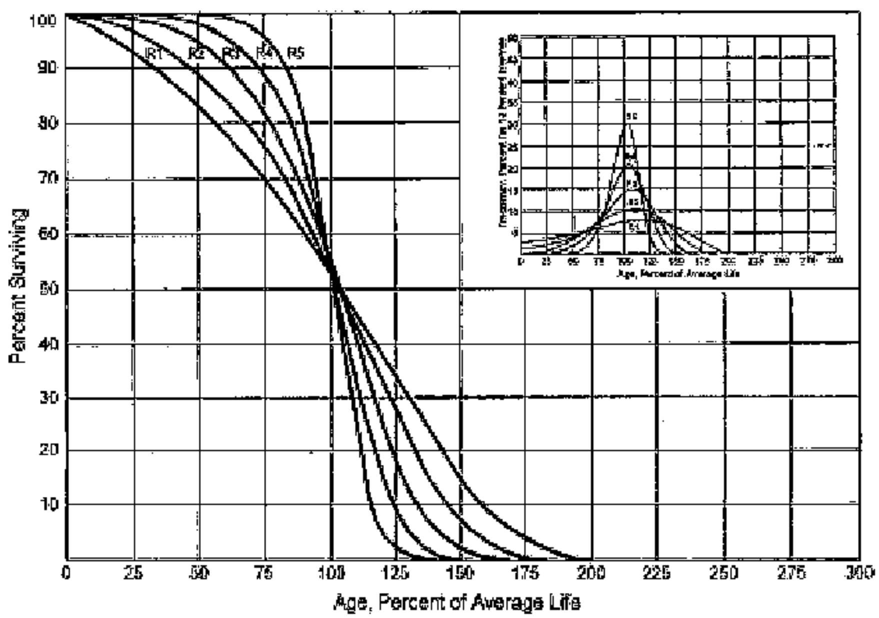
A variety of life estimation approaches were incorporated into the analyses of CenterPoint Houston data. Both Simulated Plant Record (SPR) analysis and Actuarial Analysis are commonly used mortality analysis techniques for electric utility property. Historically, CenterPoint Houston has used SPR analysis to evaluate the lives of most asset groups. Where vintaged information is available, actuarial analysis was performed. Transmission and Distribution property accounts were analyzed in this study using SPR analysis. General property accounts were analyzed in this study using actuarial analysis. For the accounts using actuarial analysis, experience bands varied depending on the amount of data. Judgment was used to a greater or lesser degree on all accounts. Each approach used in this study is more fully described in a later section.

Survivor Curves

To fully understand depreciation projections in a regulated utility setting, one must have a basic understanding of survivor curves. Individual assets within a group do not normally have identical lives or investment amounts. The average life of a group can be determined by comparing actual experience against various survivor curves. A survivor curve represents the percentage of property remaining in service at various age intervals. The most widely used set of representative survivor curves are the Iowa Survivor Curves (Iowa Curves). The Iowa Curves are the result of an extensive investigation of life characteristics of physical property made at Iowa State College Engineering Experiment Station in the first half of the twentieth century. Through common usage, revalidation, and regulatory acceptance, these curves have become a descriptive standard for the life characteristics of industrial property. An example of an Iowa Curve is shown below.



There are four families in the Iowa Curves which are distinguished by the relation of the age at the retirement mode (largest annual retirement frequency) and the average life. The four families are designated as “R”— Right, “S” — Symmetric, “L” — Left, and “O” — Origin Modal. First, for distributions with the mode age greater than the average life, an "R" designation (i.e., Right modal) is used. The family of “R” moded curves is shown below.



Second, an "S" designation (i.e., Symmetric modal) is used for the family whose mode age is symmetric about the average life. Third, an "L" designation (i.e., Left modal) is used for the family whose mode age is less than the average life. Fourth, a special case of left modal dispersion is the "O" or origin modal curve family. Within each curve family, numerical designations are used to describe the relative magnitude of the retirement frequencies at the mode. A "6" indicates that the retirements are not greatly dispersed from the mode (i.e., high mode frequency) while a "1" indicates a large dispersion about the mode (i.e., low mode frequency). For example, a curve with an average life of 30 years and an "L3" dispersion is a moderately dispersed, left modal curve that can be designated as a 30 L3 Curve. An SQ, or square, survivor curve occurs where no dispersion is present (i.e., units of common age retire simultaneously).

For Transmission, Distribution, and General Depreciated property accounts, a survivor curve pattern was selected based on analyses of historical data, as well as other factors, such as general changes relevant to the Company's operations. The blending of judgment concerning current conditions and future trends, along with the matching of historical data permits the depreciation analyst to make an informed selection of an account's average life and retirement dispersion pattern. Iowa Curves were used to depict the estimated survivor curves for each account.

Actuarial Analysis

Actuarial analysis (retirement rate method) was used in evaluating historical asset retirement experience where vintage data is available and sufficient retirement activity was present. In actuarial analysis, interval exposures (total property subject to retirement at the beginning of the age interval, regardless of vintage) and age interval retirements are calculated. The complement of the ratio of interval retirements to interval exposures establishes a survivor ratio. The survivor ratio is the fraction of property surviving to the end of the selected age interval, given that it has survived to the beginning of that age interval. Survivor ratios for all of the available age intervals were chained by successive multiplications to establish a series of survivor factors, collectively known as an observed life table. The observed life table shows the experienced mortality characteristic of the account and may be compared to standard mortality curves such as the Iowa Curves. General plant accounts were analyzed using this method. Placement bands were used to illustrate the composite history over a specific era, and experience bands were used to focus on retirement history for all vintages during a set period. Matching data in observed life tables for each experience and placement band to an Iowa Curve requires visual examination. As stated in *Depreciation Systems* by Wolf and Fitch, "the analyst must decide which points or sections of the curve should be given the most weight. Points at the end of the curve are often based on fewer exposures and may be given less weight than those points based on larger samples" (page 46). Some analysts chose to use mathematical fitting as a tool to narrow the population of curves using a least squares technique. However, *Depreciation Systems* cautions, "... the results of mathematical fitting should be checked visually and the final determination of best fit made by the analyst" (page 48). This study uses the visual matching approach to match Iowa Curves, since mathematical fitting produces theoretically possible curve matches. Visual examination and experienced judgment allow the depreciation professional to make the final determination as to the best curve type.

Detailed information for each account is shown later in this study and in workpapers.

<u>Simulated Plant Record Procedure</u>

The SPR - Balances approach is one of the commonly accepted approaches used to analyze mortality characteristics of utility property. SPR was applied to all Transmission and Distribution accounts due to the unavailability of vintaged transactional data. In this method, an Iowa Curve and average service life are selected as a starting point of the analysis and its survivor factors are applied to the actual annual additions to give a sequence of annual balance totals. These simulated balances are compared with the actual balances by using both graphical and statistical analysis. Through multiple comparisons, the mortality characteristics (as defined by an average life and an Iowa Curve) that are the best match to the property in the account can be found.

The Conformance Index ("CI") is one measure used to evaluate various SPR analyses. CIs are also used to evaluate the "goodness of fit" between the actual data and the Iowa Curve being referenced. The sum of squares difference ("SSD") is a summation of the difference between the calculated balances and the actual

$$SSD \quad \sum_1^n (Calculated\ Balance_i - Observed\ Balance_i)^2$$

balances for the band or test year being analyzed. This difference is squared and then summed to arrive at the SSD, where n is the number of years in the test band.

This calculation can then be used to develop other calculations, which the analyst feels might give a better indication for the "goodness of fit" for the representative curve under consideration. The residual measure (RM) is the square root of the average squared differences as developed above. The residual measure is calculated as follows:

$$RM = \sqrt{(\frac{SSD}{n})}$$

The CI is developed from the residual measure and the average observed plant balances for the band or study year being analyzed. The calculation of conformance index is shown below:

$$CI = \frac{\sum_1^n Balances_i / n}{RM}$$

The retirement experience index ("REI") gives an indication of the maturity of the account and is the percent of the property retired from the oldest vintage in the band at the end of the test year. Retirement indices range from zero percent to 100 percent and an REI of 100 percent indicates that a complete curve was used. A retirement index less than 100 percent indicates that the survivor curve was truncated at that point. The originator of the SPR method, Alex Bauhan, suggests ranges of value for the CI and REI. The relationship for CI proposed by Bauhan is shown below[1]:

[1] National Association of Regulatory Utility Commissioners, *Public Utility Depreciation Practices* 96 (1996).

CI	Value
Over 75	Excellent
50 to 75	Good
25 to 50	Fair
Under 25	Poor

The relationship for REI proposed by Bauhan[2] is shown below:

REI	Value
Over 75	Excellent
50 to 75	Good
33 to 50	Fair
17 to 33	Poor
Under 17	Valueless

Depreciation analysts have used these measures in analyzing SPR results for nearly 60 years, since the SPR method was developed. Both the CI and REI statistics provide the analyst with important information with which to make a comparison between a band of simulated or calculated balances and the observed or actual balances in the account being studied.

Statistics are useful in analyzing mortality characteristics of accounts, as well as determining a range of service lives to be analyzed using the detailed graphical method. However, these statistics boil all the information down to one, or at most, a few numbers, for comparison. Visual matching through comparison between actual and calculated balances expands the analysis by permitting the analyst to view many points of data at a time. The goodness of fit should be visually compared to plots of other Iowa Curve dispersions and average lives for the selection of the appropriate curve and life. Detailed information for each account is shown later in this study and in workpapers.

[2] *Id. at* 97

Judgment

Any depreciation study requires informed judgment by the analyst conducting the study. A knowledge of the property being studied, company policies and procedures, general trends in technology and industry practice, and a sound basis of understanding in depreciation theory are needed to create this informed judgment. In this depreciation study, judgment was used in areas such as survivor curve modeling and selection, depreciation method selection, simulated plant record method analysis, and actuarial analysis.

Where there are multiple factors, activities, actions, property characteristics, statistical inconsistencies, property mix in accounts, or a multitude of other considerations that affect the analysis (potentially in various directions), judgment is used to take all of these considerations and synthesize them into a general direction or understanding of the characteristics of the property. Individually, no one consideration in these cases may have a substantial impact on the analysis, but overall, the collective effect of these considerations may shed light on the use and characteristics of assets. Judgment may also be defined as deduction, inference, common sense, or the ability to make sensible decisions. There is no single correct result from statistical analysis; hence, there is no answer absent judgment.

Theoretical Depreciation Reserve

The reallocation of the book reserves is supported by authoritative texts on depreciation, widespread industry practice and acceptance by regulators.

In the process of analyzing the Company's depreciation reserve, it was observed that the depreciation reserve positions of the accounts were generally not in line with the life characteristics found in the analysis of the Company's assets. Since the allocated reserves on the books of the Company at the study date were derived by PUCT in Docket

49421 (nearly six years ago), it is appropriate to reallocate the account level book depreciation reserves using this study's proposed depreciation parameters. To allow the relative reserve positions of each account within a function to mirror the life characteristics of the underlying assets, the book accumulated provision for depreciation within each function was allocated through the use of the theoretical depreciation reserve model. The total reserve for each function did not change, but was reallocated between accounts in the function. This study used a reserve model that relied on a prospective concept relating future retirement and accrual patterns for property, given depreciation parameters for life and salvage proposed in this study.

The theoretical reserve of a property group is developed from the estimated remaining life of the group, the total life of the group, and estimated net salvage. The theoretical reserve represents the portion of the group cost that would have been accrued if current forecasts were used throughout the life of the group for future depreciation accruals. The computation involves multiplying the vintage balances within the group by the theoretical reserve ratio for each vintage. The straight-line remaining-life theoretical reserve ratio at any given age ("RR") is calculated as:

$$RR = 1 - \frac{(Average\ Remaining\ Life)}{(Average\ Service\ Life)} * (1 - Net\ Salvage\ Ratio)$$

DETAILED DISCUSSION

Depreciation Study Process

This depreciation study encompassed four distinct phases. The first phase involved data collection and field interviews. The second phase was where the initial data analysis occurred. The third phase was where the information and analysis was evaluated. After the first three stages were complete, the fourth phase began. This phase involved the calculation of depreciation and amortization rates and documenting the corresponding recommendations.

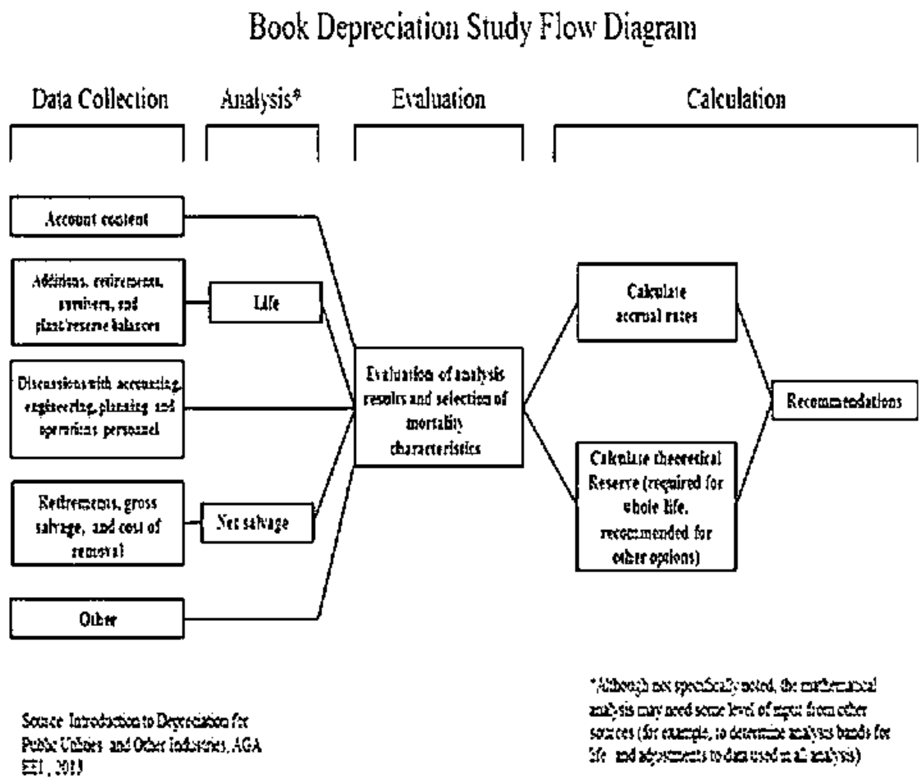
During the Phase 1 data collection process, historical data was compiled from continuing property records and general ledger systems. Data was validated for accuracy by extracting it and comparing to multiple financial system sources: Fixed Asset System (continuing property ledger), General Ledger, and interfaces from other operating systems. This data was validated against historical data from prior periods, historical general ledger sources, and through field personnel discussions. This data was reviewed extensively so that it could be put in the proper format for a depreciation study. Further discussion on data review and adjustment is found in the Salvage Consideration section of this study. Numerous discussions were conducted with engineers and field operations personnel to obtain information that would be helpful in formulating life and salvage recommendations in this study. One of the most important elements in performing a proper depreciation study is to understand how the Company utilizes assets and the environment of those assets. Understanding industry and geographical norms for mortality characteristics are important factors in selecting life and salvage recommendations; however, care must be used not to apply them rigorously to any particular company since no two companies would have the same exact forces of retirement acting upon their assets. Interviews with engineering and operations personnel are important data-gathering operations that allow the analyst to obtain information that is helpful when evaluating the output from the life and net salvage programs in relation to the Company's actual asset utilization and environment. Information regarding these discussions is found in both the Detailed Discussion portions of the Life Analysis and Salvage Analysis sections and also in workpapers. In addition, Alliance personnel possess a significant understanding of the property and its forces of retirement due to years of day-to-day exposure to property and operations of electric utility property.

Phase 2 is where the SPR and actuarial analysis were performed. Phase 2 and Phase 3 (to be discussed in the next paragraph) overlap to a significant degree. The detailed property record information was used in Phase 2 to develop observed life tables for life analysis and SPR graphs and statistics. Net salvage analysis consists of compiling historical salvage and removal data by account to determine values and trends in gross salvage and removal cost. This information was then carried forward into Phase 3 for the evaluation process.

Phase 3 is the evaluation process, which synthesized analysis, interviews, and operational characteristics into a final selection of asset lives and net salvage parameters. The historical analysis from Phase 2 was further enhanced by the incorporation of recent or future changes in the characteristics or operations of assets that were revealed in Phase 1. The preliminary results were then reviewed and discussed with accounting and operations personnel. Phases 2 and 3 validated the asset characteristics seen in the accounting transactions with actual Company operational experience.

Finally, Phase 4 involves calculating accrual rates, making recommendations, and documenting the conclusions in a final report. The calculation of accrual rates is found in Appendix B. Recommendations for the various accounts are contained within the Detailed Discussion of this report. The depreciation study flow diagram shown as Figure

1[3] documents the steps used in conducting this study. Depreciation Systems[4], a well-respected scholarly treatise on the topic of depreciation, documents the same basic processes in performing a depreciation study, namely: statistical analysis, evaluation of statistical analysis, discussions with management, forecast assumptions, and document recommendations.



CENTERPOINT ELECTRIC DEPRECIATION STUDY PROCESS

[3] American Gas Association and Edison Electric Institute, *Introduction to Depreciation for Public Utilities and Other Industries* (2013).
[4] W.C. Fitch and F.K. Wolf, *Depreciation Systems* 289 (Iowa State Press 1994).

Depreciation Calculation Process

Annual depreciation expense amounts for all accounts were calculated by the straight-line, remaining life procedure.

In a whole life representation, the annual accrual rate is computed by the following equation,

$$\text{Annual Accrual Rate} = \frac{(100\% - \text{Net Salvage Percent})}{\text{Average Service Life}}$$

Use of the remaining life depreciation system adds a self-correcting mechanism, which accounts for any differences between theoretical and book depreciation reserve over the remaining life of the group. With the straight line, remaining life, average life group system using Iowa Curves, composite remaining lives were calculated according to standard broad group expectancy techniques, noted in the formula below:

$$\text{Composite Remaining Life} = \frac{\sum \text{Original Cost} - \text{Theoretical Reserve}}{\sum \text{Whole Life Annual Accrual}}$$

For each plant account, the difference between the surviving investment, adjusted for estimated net salvage, and the allocated book depreciation reserve, was divided by the composite remaining life to yield the annual depreciation expense as noted in this equation, where the net salvage percent represents future net salvage.

$$\text{Annual Depreciation Expense} = \frac{\text{Original Cost} - \text{Book Reserve} - (\text{Original Cost} * \text{Net Salvage \%})}{\text{Remaining Life}}$$

Within a group, the sum of the group annual depreciation expense amounts, as a percentage of the depreciable original cost investment summed, gives the annual depreciation rate as shown below:

$$\text{Annual Depreciation Rate} = \frac{\sum \text{Annual Depreciation Expense}}{\sum \text{Original Cost}}$$

These calculations are shown in Appendix B. The calculations of the theoretical depreciation reserve values and the corresponding remaining life calculations are shown in Appendix E. Book depreciation reserves were reallocated within a functional group to individual accounts based on the theoretical reserve computation. These reserve reallocation computations are also shown in Appendix E.

LIFE ANALYSIS

Account 303 Computer Software (3, year, 5 year, 7 year, 10 year, and 15 year)

This account consists of computer software. As utilities have become more dependent on technology, CenterPoint Houston's investment in intangible plant has increased to $510.6 million at December 31, 2022. Software is depreciated over a 5-year, 7-year, 10-year, or 15-year life depending on the purpose of the system.

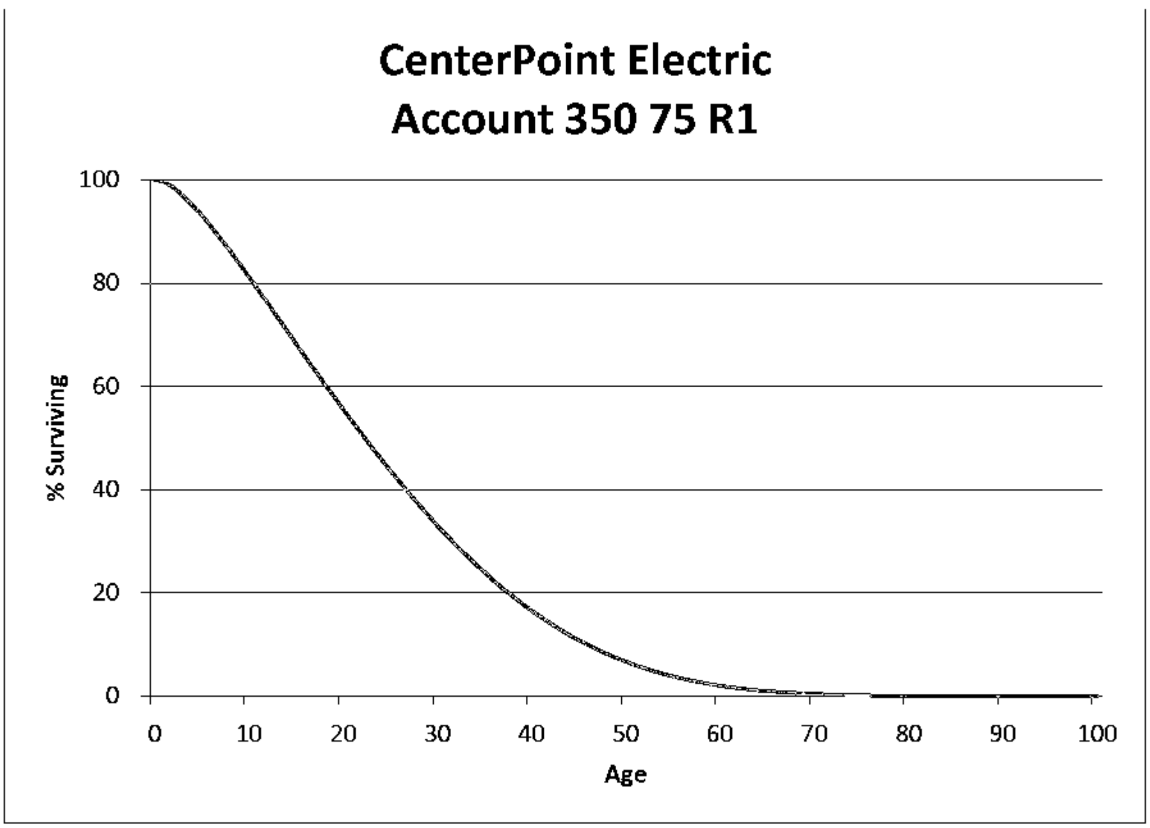
Company Subject Matter Experts ("SMEs") with the Technology group assess and assign depreciable lives to the technology systems and assets the Technology group manages. Their assessment is based on a review of various criteria, including significant changes associated with digital security risks; the software support lifecycle policies maintained by the major third-party vendors, such as IBM, Oracle, and Microsoft; the anticipated life of the functions provided by the technology systems or assets; the maximum term of an agreement provided by the vendor; and the categorization of the technology system or asset.

The Technology group also monitors trends in the software industry relating to product lifecycles, such as trends in technical support and licensing models. As part of the Technology group's ongoing review of the depreciable lives since CenterPoint Houston's last depreciation study, it has determined that it is still appropriate to continue using the five-year, seven-year, ten-year, and fifteen-year categories that have historically been used. However, the Technology group is proposing that a new three-year life group category be used for hosted software applications with three-year fixed-term agreements, resulting in the need for a new three-year life group category for cloud computing projects. We have added a 3-year category to the other categories recommended in this study.

TRANSMISSION PROPERTY, FERC ACCOUNTS 350-358

Account 350 Land Rights (75 R1)

This account consists of land rights and easements associated with Transmission lines or Transmission substations. The current balance is $154.6 million. The approved life for this account is 75 years with an R1 dispersion. Minimal retirement activity in this account produced insufficient data for analysis. The predominant assets using these land rights are transmission poles and conductor with recommended lives of 57 and 60 years. Using judgment, this study recommends retaining the 75-year life and R1 dispersion for this account. A representative graph of the curve shape is shown below.

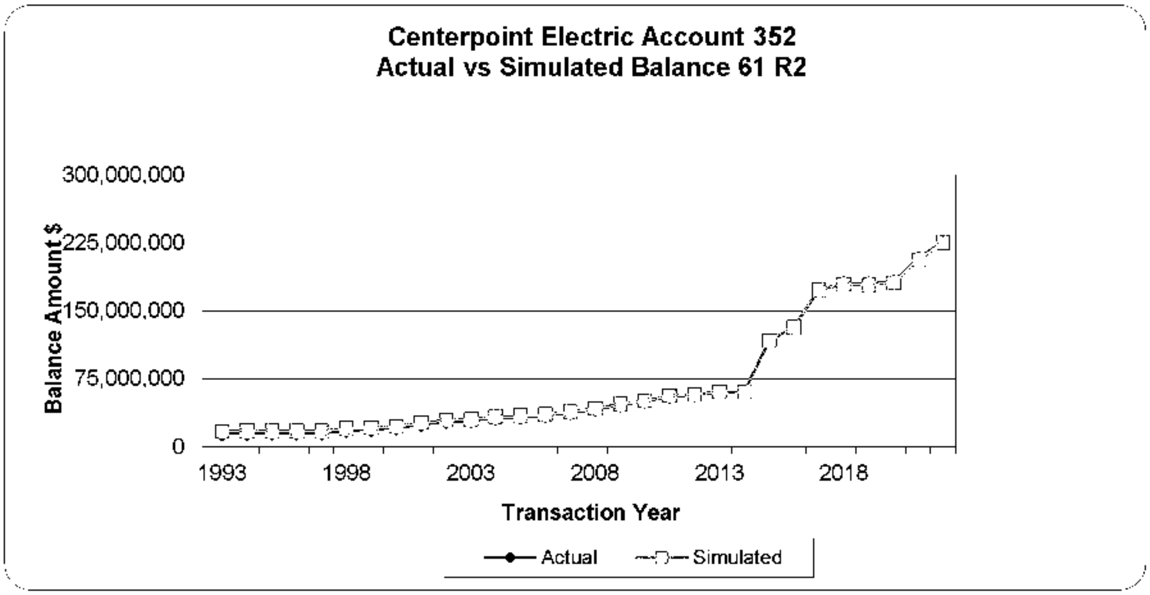


Account 352 Structures and Improvements (61 R2)

This account includes fencing, small buildings, and other non-electrical assets found around and in a substation that are used in connection with transmission operations. The balance in this account is $226.5 million. The approved life for this account is 60 years with the R1.5 dispersion.

Company subject matter experts ("SMEs") report that transmission replacements are often caused by congestion and changing load patterns. Since 2000, there has been a lot of activity. Reconductoring transmission can also affect substations (causing substation conversions). For hardening purposes, Company personnel report they would replace control houses for reasons such as raising the level to protect from floods. They report that a 60 year life for transmission and distribution structures is reasonable.

In examining SPR results, the only bands that produced an excellent CI were the shortest 10- and 20-year bands, which authoritative literature deems too narrow to yield life estimates for property that has a life of at least 40 years. The other bands in the SPR analysis indicated a 61 year life with dispersion in the R family with an excellent REI, or a 56-year life with dispersion in the S family. Although there are factors that may cause earlier retirements, the engineers believe the assets will last up to 60 years under normal conditions. Given the engineering input, this study recommends moving to a 61-year life and to an R2 dispersion for this account given the strong REI results supporting the dispersion in the R family. A graph comparing the actual balances to balances simulated using a 61 R2 curve for this account is shown below.


Centerpoint Electric Account 352
Actual vs Simulated Balance 61 R2
Balance Amount $
300,000,000
225,000,000
150,000,000
75,000,000
0
1993
1998
2003
2008
2013
2018
Transaction Year
Actual
Simulated

Account 353 Station Equipment (54 R0.5)

This account contains a wide variety of transmission substation equipment, from circuit breakers to switchgear. The balance in this account is $1.3 billion. The approved life for this account is 53 years with the R0.5 dispersion.

In examining SPR results, band less than 40 years were not given weight in the life selection process, since authoritative literature deems those bands too narrow to yield life estimates for property with a life of at least 40 years. In evaluating the SPR analysis, the bands of 70 years and longer show that the 54 R0.5 curve produces an excellent REI and the highest CI. Bands of 60 years and less exhibited shorter lives for the best fitting curves but were given less weight in the selection process since the results are impacted by large retirements from 2002 onward (these retirements are related to the Company's reconductoring efforts) as compared to prior years. Even in the shorter bands greater than 40 years, the 54 R0.5 is in the top five ranked curves.

In the Transmission function, Company SMEs report that replacements are caused by congestion and changing load patterns. Since 2000, there has been a lot of reconductoring. Reconductoring transmission can also affect substations (causing substation conversions). There is a plan to convert all 69kV to 138kV but the conversion will take 5 years or more to finish. This can affect both station equipment as well as poles/insulators and conductor. Substation analytics show a composite life around 55 years. There are many different components in this account with varying lives.

- Company personnel indicated that the operational life expectation for breakers is over 30 years. They have replaced 160 breakers in the last five years. Fault duty and loading are two drivers of transmission breaker replacement.
- Company personnel indicate that 40-50 years is a reasonable operational life expectancy for autotransformers and power transformers. They report that Auto transformers and Power transformers are replaced at the rate of

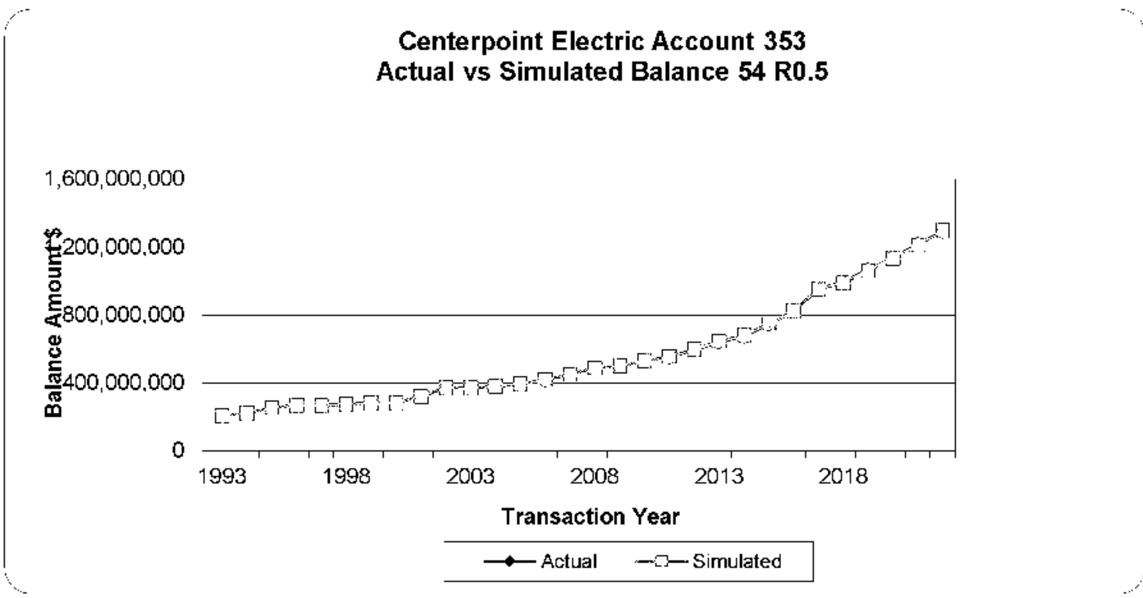
approximately 3 per year. Average age of Power transformers is 27.3 years and for Auto is 23 years per Company personnel.

- SCADA/RTUs – replacing under a program (replaced 44 in last 5 years). The Company would expect a 15 year operational life.
- Circuit Switchers are being replacing under a program at an estimated rate of 25-30 per year. Company SMEs expect around a 30 year life operationally.
- Electromechanical relays are expected to have a 30-40 year operational life (lower end of the range for distribution and higher for transmission).
- Microprocessor relays are expected to have a life of 15-20 years. The Company is proactively replacing electromechanical relays with microprocessor relays. Currently less than 60%-70% of the relays are microprocessors. The Company only buys microprocessor-based relays now.

Transmission power transformers have an average age of 30 years, but the Company has several over 40 years old. A portion of the older transformers are approaching end of life. Some are over 50 years old and the Company is working toward retirement (primarily by moving from 69kV to 138 kV) whenever possible. The Company looks at several transformers on an annual basis – gas and oil analysis, and is beginning to install on-line monitoring. Even though a transformer may not fail during hurricanes, those events may shorten the life of the assets due to the short circuits that occur during that time frame.

Assets are generally run to failure. Transmission circuit breakers have a program to replace them. The targeted circuit breaker replacement program focuses on those installed in the 70s and 80s. 345kV breakers in the 30-35 year range are being replaced. 69kV breakers are being replaced at an older age. As with transformers, some time periods have more issues with design than others (those manufactured in the 1980s primarily).

Given the sound REI and CI results shown in the longer bands, the age and expectation for the assets, and Company interviews, this study recommends a 54-year life and R0.5 dispersion for Account 353. A graph comparing the actual balances to balances simulated using a 54 R0.5 curve for this account is shown below.



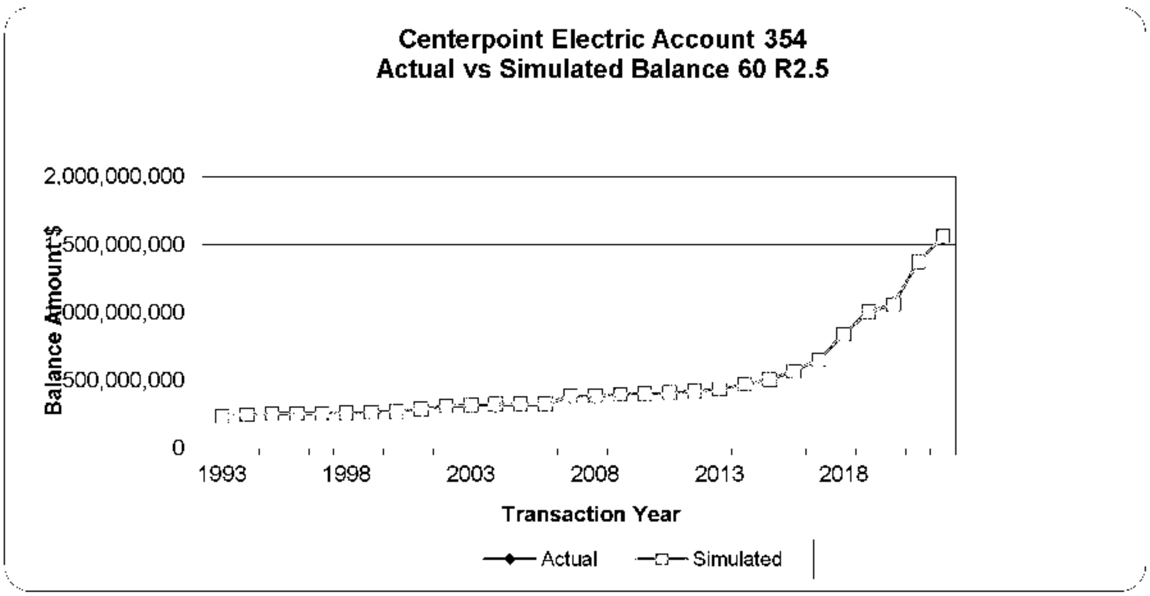
Account 354 Towers and Fixtures (60 R2.5)

This account consists of transmission towers which are used to transmit electricity at a voltage of 69 kV and above. Towers are made of steel and the height of the towers range from 55' to 150' depending on location and design. The approved life for this account is 59 years with the R2.5 dispersion. The balance in this account is $1.6 billion.

Looking at bands of 30 years or longer, the SPR analysis indicates that the 60 R2.5 curve produces the highest (rated excellent) REI and an excellent CI and is in the top 10 ranked curves.

Discussions with Company engineers indicated that the preventative maintenance program will allow the towers to remain in service for a long period of time. As long as maintenance is maintained for the structures, Company SMEs report that an operational life of 60 years is achievable. The life of steel towers would be expected to last longer than steel poles (lattice towers can be repaired instead of being replaced like poles). Steel poles are direct embedded in many cases, which would decrease the life for the steel. A primary driver for retirement is electrical capacity upgrades requiring reconductoring, which the Company has completed on nearly 1/3 of the system since 2000. Some towers (maybe 10% of towers) were replaced due to the reconductoring, which could be impacting the life analysis. Foundations are a factor in retirements due to higher loading on towers requiring replacement of foundations and some adverse chemical reactions in foundations are causing some to be replaced as well. They will replace all or a portion of the structure when having to replace the foundation. There is a maintenance program in place to keep towers painted when the initial galvanized coating on the steel has been depleted, which extends the useful lives. Accordingly, although other factors may cause towers to be replaced earlier, engineers believe the towers should last up to 60 years under normal conditions.

This study recommends moving to a 60-year life and retaining the R2.5 dispersion for this account based on the analysis. A graph comparing the actual balances to balances simulated using a 60 R2.5 curve for this account is shown below.



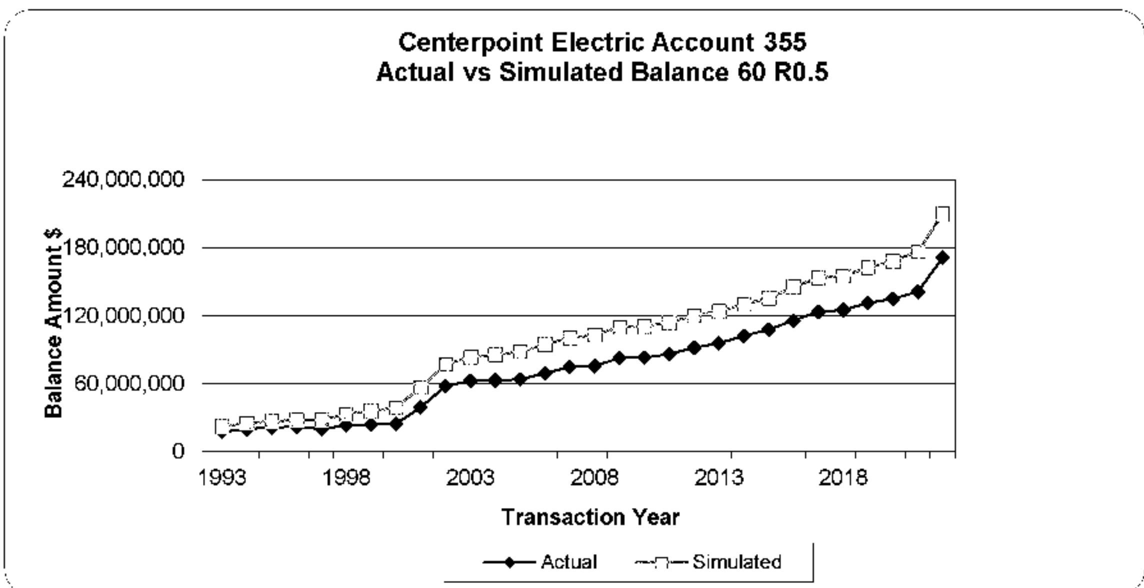
Account 355 Poles and Fixtures (60 R0.5)

This account consists of transmission poles and fixtures used to transmit electricity at a voltage of 69 kV and above. Poles are made of wood, concrete, or metal, and the height of the poles ranges from 35’ to 105’ depending on location and design. As building of transmission lines for interconnections, growth, and merchant plant activity has occurred in recent years, the balance in this account is now $123.4 million. The approved life for this account is 60 years with the R0.5 dispersion.

The SPR bands of 20 years or longer were examined and indicated an R0.5 dispersion with an unexpectedly low 20 year range as the best fit. In these results, although the REIs were excellent, the CIs were extremely poor (indicating that there was not a good match between the actual experience and the best fitting life/curve). SPR is set up to model additions, retirements, and balances, but activity such as transfers or adjustments can make the results less reliable. In this case, a transfer of $36.3 million between this account and Account 354 occurred in 2016. Similar results with low average lives were seen in the SPR analysis for this account in Docket 49421. A number of factors limit the life of poles, such as road widening, line upgrades, automobiles striking poles, and environmental conditions. Changes in the type of poles (i.e., moving from wood to steel or concrete) and mix will eventually increase the life.

Discussions with Company engineers indicated a longer life expectation than that seen in the analysis. Within the next five years or more, the Company will have replaced all wood poles with concrete or steel. The oldest concrete poles are from the 1980s (some of which have already been replaced due to capacity issues). The Company began installing concrete poles around 1987, and there have only been a few issues with cracking in the concrete. There were, however, a few that did not have appropriate grounds and had issues. Resiliency would affect wood poles (lowering life) more than other types of poles. There have been a few projects where concrete poles were replaced with steel when reconductoring. Company engineering personnel indicate that concrete poles would have a longer life than wood, perhaps up to 60 years or longer. For steel poles, rust is an issue, but they are expected to last close to as long as towers. Company personnel believe a life closer to 60 years reflects the current and future asset mix in this account.

Discounting the very short lives seen in the analysis and relying more on the changing type and mix of assets and discussions with the Company, this study recommends retaining the 60-year life and R0.5 dispersion. A graph comparing the actual balances to balances simulated using a 60 R0.5 curve for this account is shown below.



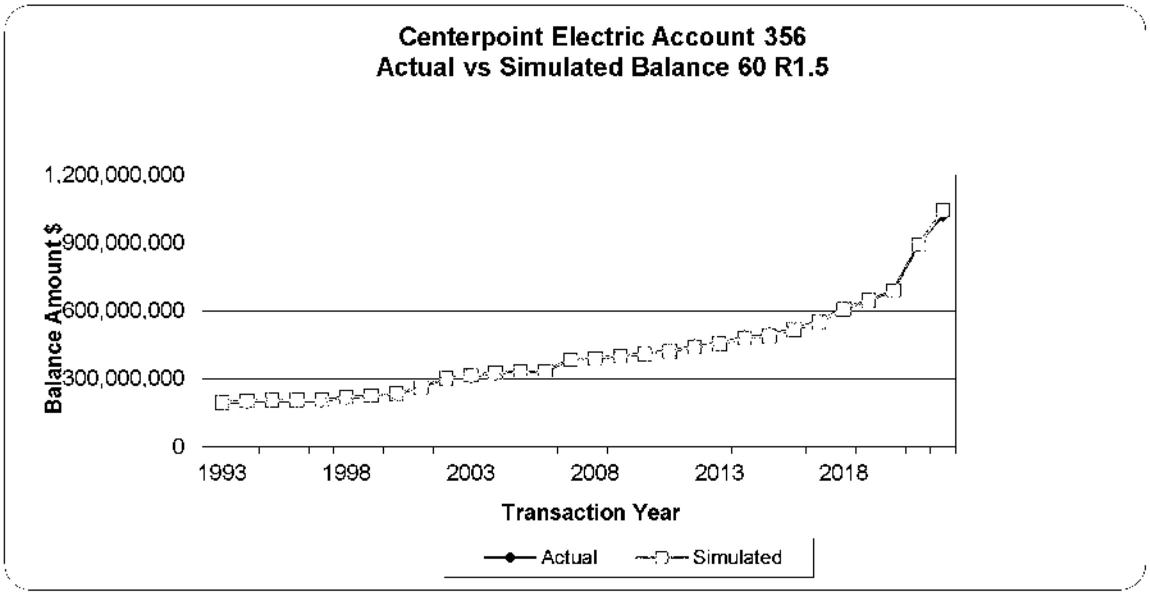
Account 356 Overhead Conductor/Devices (60 R1.5)

This account consists of transmission overhead conductors and insulators which are used to transmit electricity at voltages of 69 kV and above. Conductors can consist of aluminum, copper, metal, or steel of various diameters depending on location and design. The balance in this account is $1.0 billion. The approved life for this account is 61 years with the R1.5 dispersion.

SPR analysis was used to establish the life characteristic. In examining bands of various widths, a 60 R1.5 curve is the highest-ranked curve with an REI consistently over 90 percent across every band width up to 50 years. The CIs were low and in the fair range.

Discussions with Company engineers indicated that they expect approximately the same life for conductor as for the poles and towers. The Company has been reconductoring using a more robust high-temperature conductor (ACSS). Splices are the weakest area as conductor gets older and are the area of greatest concern causing replacement of the conductor. They now have a better insulator for coastal areas. Polymer insulators are normally replaced on a 20 to 25 year cycle (except in contaminated areas like coastal areas where the replacement cycle is 15 years). The Company believes an overall 60-year operational life is a good estimate.

Based on the analysis, type of assets, and Company input, this study recommends moving from a 61-year life to a 60-year life and retaining the R1.5 dispersion for this account. A graph comparing the actual balances to balances simulated using a 60 R1.5 curve is shown below.


Centerpoint Electric Account 356
Actual vs Simulated Balance 60 R1.5
Balance Amount $
1,200,000,000
900,000,000
600,000,000
300,000,000
0
1993
1998
2003
2008
2013
2018
Transaction Year
Actual
Simulated

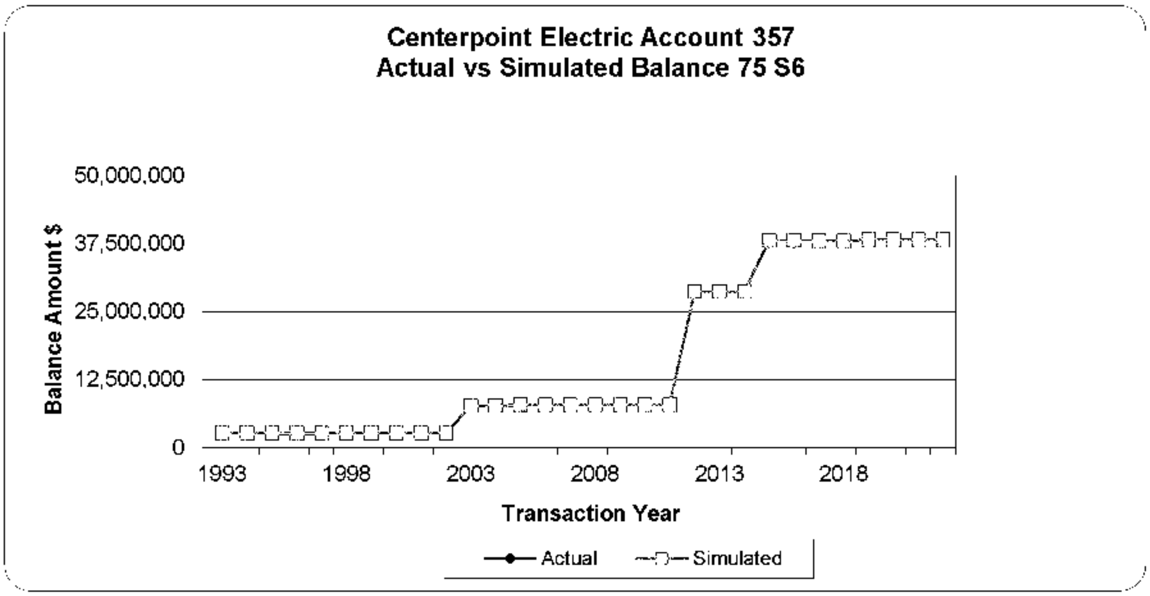
Account 357 Underground Conduit (75 S6)

This account consists of underground conduit used for the transmission network serving the CenterPoint Houston service area. The approved life for this account is 60 years with the R5 dispersion. The balance in this account is $38.2 million.

The SPR analysis yielded results with good Cis, but poor REIs. Notably, the highest REI in any band is 24, which is in the valueless range. This renders the SPR analysis less useful in determining the life of the asset group.

Underground conduit is installed in three places across the Company's system: along I-10 corridor (PVC), downtown Houston area (oil filled), Galveston downtown area (primarily oil filled), and a marine cable. Company personnel report that dig-ins are a major cause of retirements. PVC conduit is always encased in concrete, and the Company will re-pull cable in conduit when appropriate. Discussion with Company engineers indicated that they use PVC versus oil-filled pipe on a 2 to 1 ratio. The factors that affect retirements are that oil-filled pipe needs full cathodic protection and needs to maintain integrity since the pipe is under pressure. Also, water infiltration could cause issues for PVC with conductor. Company personnel agreed that moving to a longer life is reasonable.

Based on the analysis, more weight has been given to the information obtained during Company interviews than to the historical data. Considering the type of assets in this account, the life expectations of Company engineers, and judgment, this study recommends moving to a 75-year life and moving to an S6 dispersion at this time. A graph comparing the actual balances to balances simulated using a 75 S6 curve for this account is shown below.

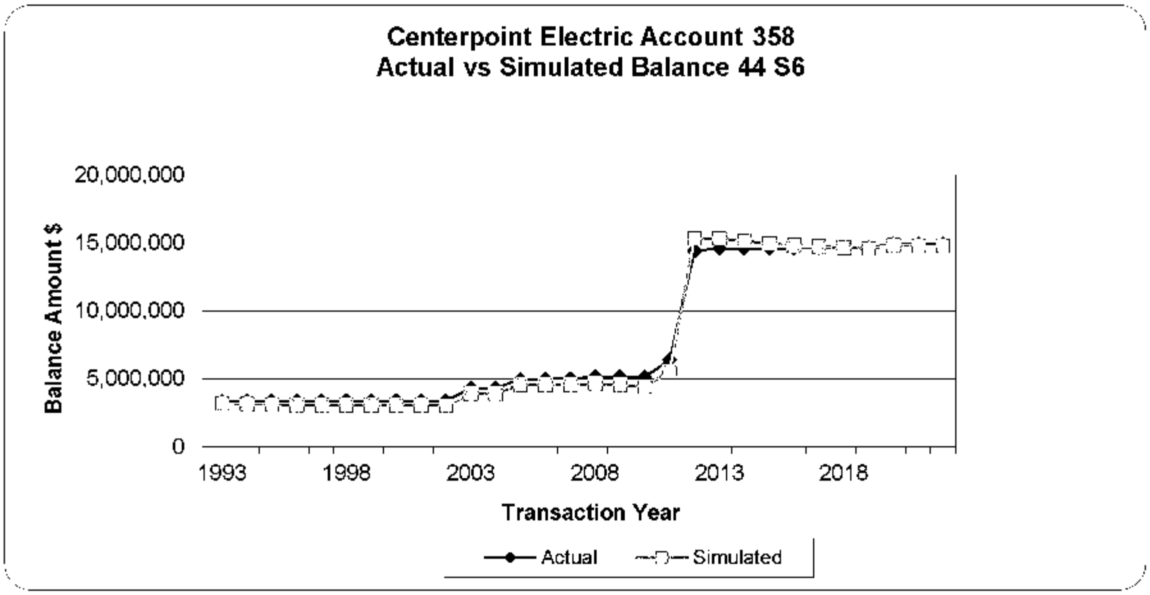

Centerpoint Electric Account 357
Actual vs Simulated Balance 75 S6
Balance Amount $
50,000,000
37,500,000
25,000,000
12,500,000
0
1993
1998
2003
2008
2013
2018
Transaction Year
Actual
Simulated

Account 358 Underground Conductor/Devices (44 S6)

This account consists of underground conductor used for the transmission network serving the CenterPoint Houston service area. The approved life for this account is 44 years with the S6 dispersion. The balance in this account is $14.9 million.

The SPR analysis yielded results with poor Cis and excellent REIs, with the top ranked curve being the 44 S6 in bands of 40 to 60 years. In bands of 70 years and longer a 44 SQ is the highest ranked curve, and the 44 S6 is the second ranked. Discussions with Company engineers indicated that the Company moved to solid dielectric conductor 15-20 years ago. Manufacturer expectation is 40 to 50 years, and the design life per the manufacturer is 40 years. The life is influenced by how heavily the conductor is loaded. A “low electrically stressed” line would possibly have a longer life. High heating due to higher loading causes cable to expand and contract like rubber bands and creates stress on the surrounding insulation (expansion and contraction in a confined space). The pipe type of conductor has been in service longer than the dielectric. Highly stressed lines would still be in the 40-year range if staying within the design limits of the cable. Company engineers believe an operational life around 44 years is reasonable.

Based on information from the manufacturer and Company interviews as well as the life analysis, this study recommends retaining a 44 S6 for this account. A graph comparing the actual balances to balances simulated using a 44 S6 curve for this account is shown below.


Centerpoint Electric Account 358
Actual vs Simulated Balance 44 S6
Balance Amount $
20,000,000
15,000,000
10,000,000
5,000,000
0
1993
1998
2003
2008
2013
2018
Transaction Year
Actual
Simulated

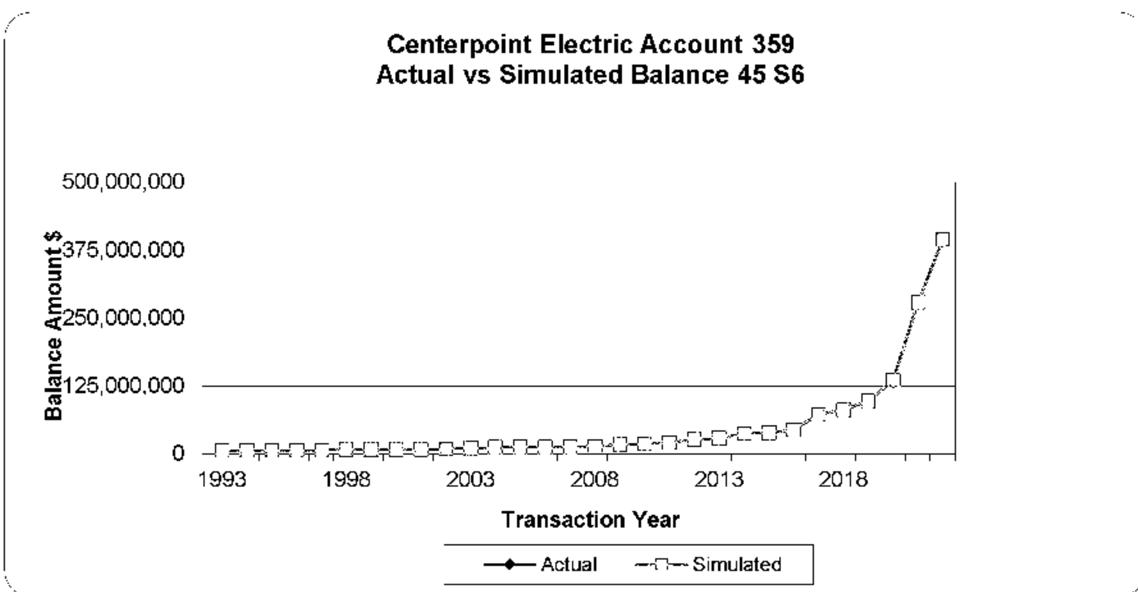
Account 359 Roads & Trails (45 S6)

This account consists of roads and trails. The approved life for this account is 52 years with the S6 dispersion. The current balance is $393.8 million.

Over the SPR bands examined, other than the SQ dispersion, the S6 produced excellent Cis and REIs consistently across the bands. The SQ curve was higher ranked but was discounted as not being as reasonable a retirement pattern for this type of utility asset.

Discussions with Company personnel indicated that culvert replacements are the primary retirements that would occur in the account.

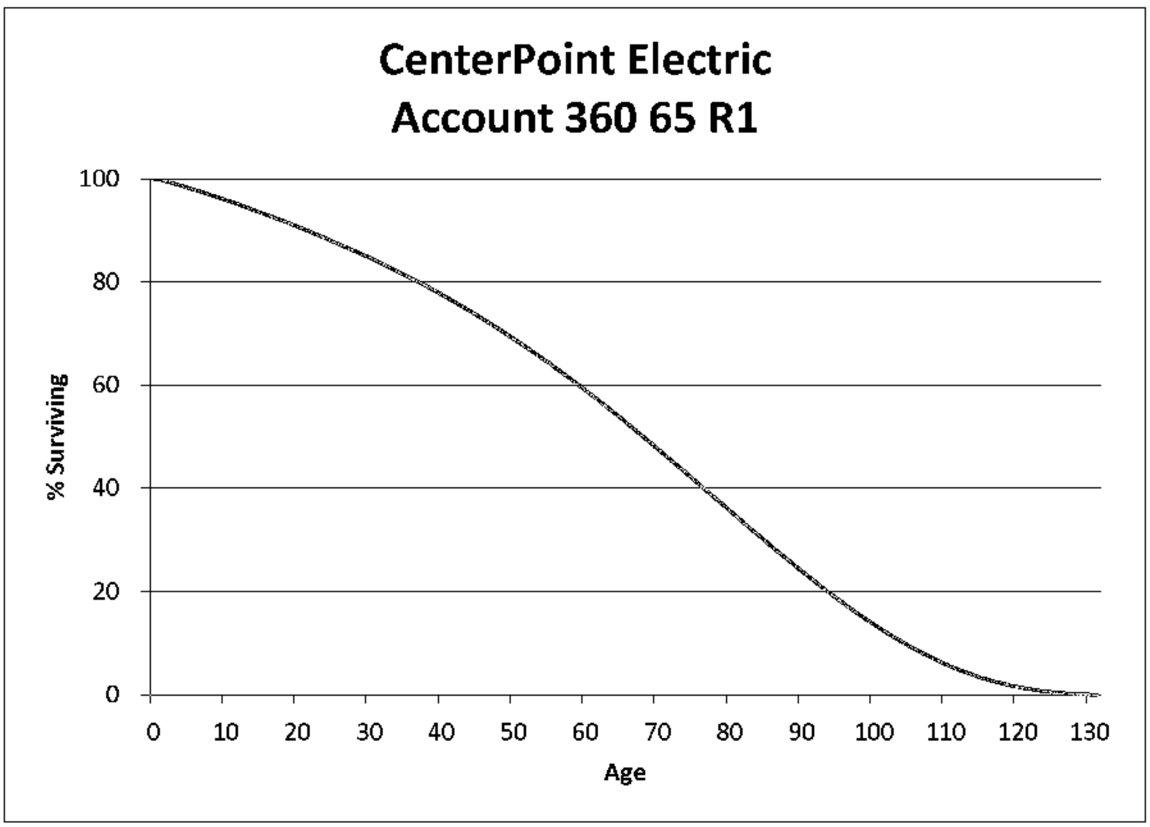
Based on the analysis, type of assets, and input from Company engineers, this study recommends decreasing the life to 45 years and retaining the S6 dispersion for this account. A graph comparing the actual balances to balances simulated using a 45 S6 curve for this account is shown below.



Distribution Property, FERC Accounts 360-373

Account 360 Land Rights (65 R1)

This account consists of land rights and easements associated with distribution property or distribution substations. The current balance in this account is $1.2 million. Minimal retirement activity produced insufficient data for analysis. The approved life for this account is 60 years with an R1 dispersion which was established in Docket No. 38339. This study recommends increasing the life to 65 years while maintaining the R1 dispersion for this account. A representative graph of the curve shape is shown below.



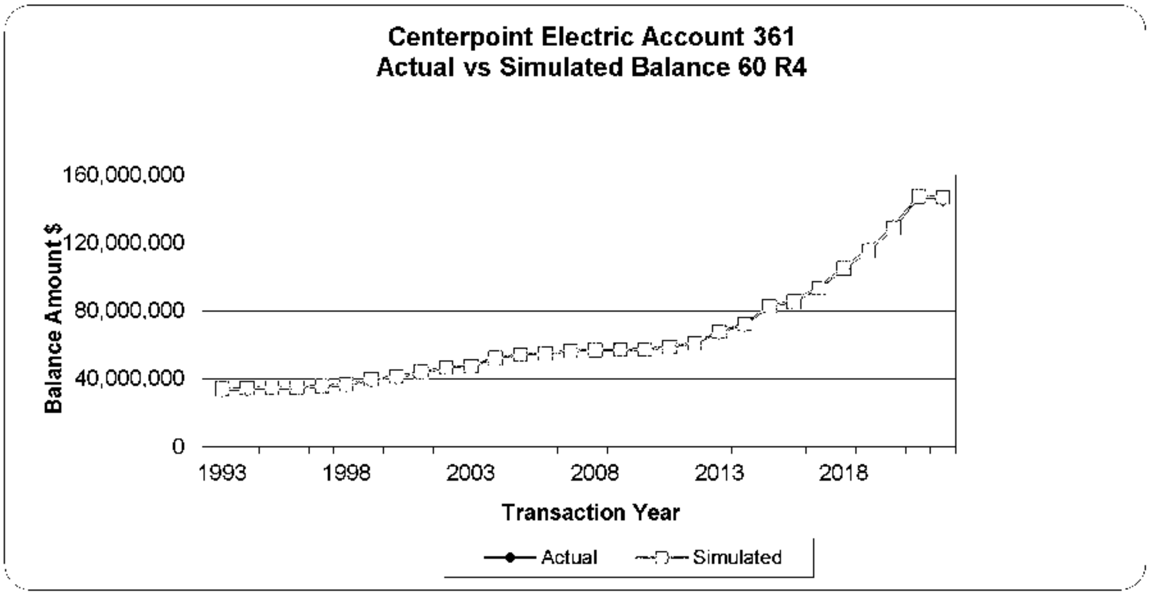
Account 361 Structures and Improvements (60 R4)

This account includes investment in structures and improvements used in connection with distribution operations. Examples of property in this account include fencing, small buildings, and other non-electrical assets. The balance in this account is $145.6 million. The approved life for this account is 60 years with the R4 dispersion.

The SPR analysis shows the R4 curve produced an REI of 100 and an excellent CI, although it is not in the top ranked curves. Many of the top ranked curves do not produce excellent REIs and in many cases have very poor REIs. Looking to curves with both excellent Cis and REIs, the R3 curve was a possible selection, but its REI of 92.71 was much lower than the 100 of the R4. Moreover, the life of the R3 curve at more than 70 years does not match operational expectations for this account.

Discussions with Company engineers indicated that Transmission and Distribution assets in this account are similar and that they would expect similar life characteristics to Account 352, Transmission Structures and Improvements which has a recommended life of 61 years with a R2 dispersion. From an operations perspective, Company SMEs believe the operational life of this account is about 60 years.

Based on the analysis, the types of assets in this account, and engineering input, this study recommends retaining the 60-year life with the R4 dispersion. A graph comparing the actual balances to balances simulated using a 60 R4 curve for this account is shown below.


Centerpoint Electric Account 361
Actual vs Simulated Balance 60 R4
160,000,000
120,000,000
80,000,000
40,000,000
0
Balance Amount $
1993
1998
2003
2008
2013
2018
Transaction Year
Actual
Simulated

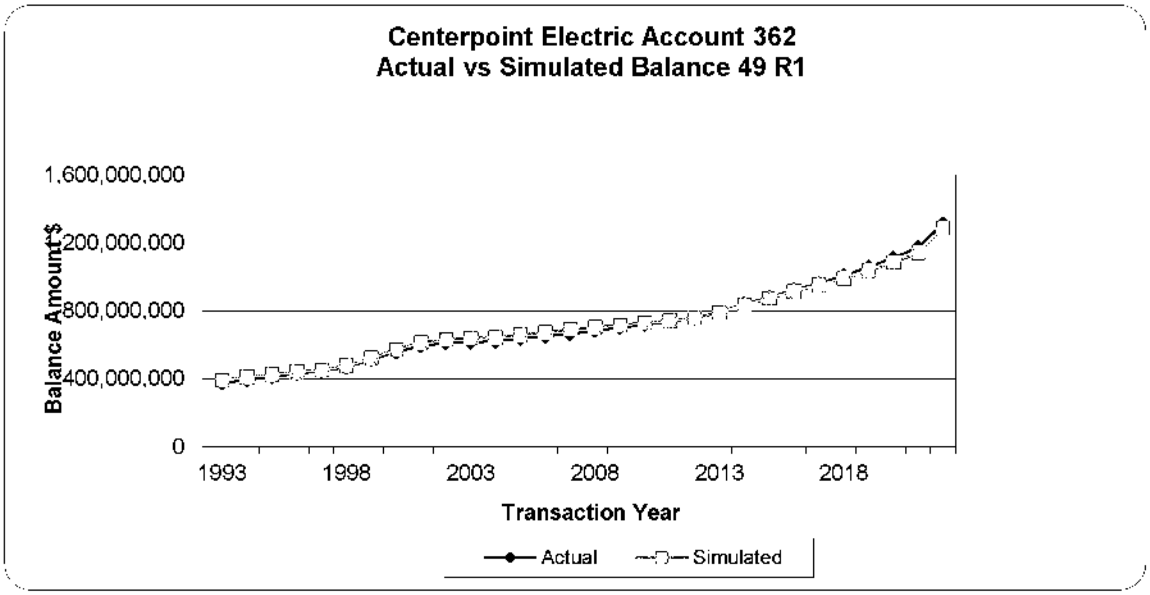
Account 362 Station Equipment (49 R1)

This account contains a wide variety of distribution substation equipment, including station transformers, circuit breakers, switchgear, and relays. The balance in this account is $1.4 billion. The approved life is 48 years with the R1 dispersion.

Using SPR analysis, the 49 R1 curve produced the best combination of REI and CI in most bands of 20 years and longer. Shorter bands produced L0 and L0.5 curves as the top ranked by CI, but the REIs were lower than the 100 exhibited by the R1 curve.

The components in this account are very similar to those in Account 353 Transmission Station Equipment. The transmission account is impacted by planned maintenance and replacements. Company SMEs report that distribution substations have more changes in voltage causing more wear and tear. Company interviews indicate plans to replace switchboard panels, as well as moving to a higher level of electronics in substations. These factors may serve to limit asset life and tend to create downward pressures on life in the future. Company SMEs believe the life of this account will be shorter due to usage and voltage fluctuations.

Discounting the indications from the short bands due to the limited band width, inconsistent indications between full and short bands, and a lower life than would be expected from the assets in this account, the fuller bands were relied upon for the life selection. Based on all these factors, this study recommends moving to 49 R1 for this account. A graph comparing the actual balances to balances simulated using a 49 R1 curve for this account is shown below.


Centerpoint Electric Account 362
Actual vs Simulated Balance 49 R1
1,600,000,000
1,200,000,000
800,000,000
400,000,000
0
Balance Amount $
1993
1998
2003
2008
2013
2018
Transaction Year
Actual
Simulated

Account 363 Battery Storage Equipment (10 SQ)

This account includes the cost of energy storage equipment used to store energy for load management purposes. Currently, there is no plant in this account, but the Company has indicated it is possible it could add assets to this group at some point in the future and would require a depreciation rate if that occurs. With no historical data to rely on, industry experience was used to determine the service life. Based on experience with others in the industry, this study recommends using a 10-year life with an SQ dispersion. No graph is shown for this account.

Account 364 Poles, Towers, and Fixtures (37 R0.5)

This account contains poles and towers of various material types: wood, ductile iron, and fiberglass. Height of these assets can range from under 25' to in excess of 110' feet. The approved life for this account is 35 years with the R0.5 dispersion. The balance in this account is $1.2 billion.

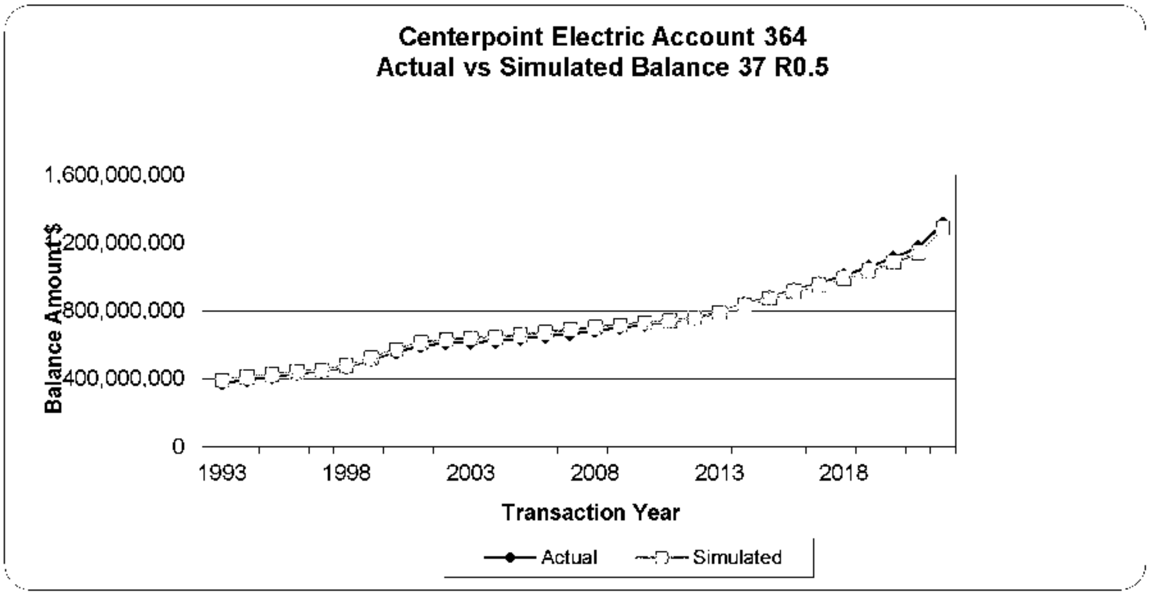
In every SPR band of 30 years and longer examined, the R0.5 was the top ranked choice by CI, with an REI of 100 in all bands. In all of the fuller bands, the life for the R0.5 was shown as approximately 37 years. Bands of 10 or 20 years do not meet the width advised by authoritative treatises and were not considered in the life selection process.

The Company now uses poles made of wood, ductile iron, and fiberglass. Manufacturer expectations are that ductile iron and fiberglass poles would last much longer than 30 years. The manufacturer gives a 41 year warranty for their fiberglass poles. The life of ductile iron poles would be impacted by contaminants, and fiberglass glass poles may be impacted by ultraviolet light. Company SMEs generally see an operation life of 30 years or more for wood poles under general conditions. Where water tables are high, lives will be shorter. Approximately 20% of the time, Company SMEs report that they use fiberglass or ductile iron in a replacement or new addition. There is no planned program to replace wood poles.

There is a cost differential depending on material type: wood poles would cost $7,300 and fiberglass poles cost $11,000, including labor and material for both types. In the last two years, there has been a significant increase in the cost of wood poles driven by supply chain issues and increased demand. There are some teams working on grid resiliency, but no plans are in place at this point related to poles. Across the system as a whole, about three percent of the poles are made of engineered structure (concrete, ductile iron, or fiberglass).

Discussions with Company engineers indicate that pole life can be impacted by high acidity levels in the soil and high humidity. The company begins inspecting wood poles at a 10-year cycle in 10 year increments. The Company also performs ground line treatment and sounding tests – if a pole fails, they will brace or replace depending on condition. There is about a 5% reject rate (with around ½ replaced and ½ braced). More contaminated areas use poles with insulation or stainless steel. Those contaminated areas are the coastal area (about 10%) or the Ship Channel (another 10%). The Company's service area is vulnerable to lightning strikes. Company SMEs report that they moved from Creosote to chromated copper arsenate ("CCA") then back to creosote in the last 20 or more years. CCA tends to make poles more brittle than with creosote, and there are some twisting issues and chemical release with CCA. CCA poles cost more to dispose of than creosote. Pole upgrades occur due to additional pole contacts or maintaining clearance. Fast growth poles will not last as long as old growth forest (bacteria get into newer elongated cell structure more quickly than old growth). Under general conditions, pole life in the range of 30 to 35 years can be achieved based on operational experience.

Given the solid 37-year life indications from the analysis and discussions with Company engineers, this study recommends moving to a 37-year life and R0.5 dispersion for this account. A graph comparing the actual balances to balances simulated for this account is shown below.


Centerpoint Electric Account 364
Actual vs Simulated Balance 37 R0.5
1,600,000,000
1,200,000,000
800,000,000
400,000,000
0
Balance Amount $
1993
1998
2003
2008
2013
2018
Transaction Year
Actual
Simulated

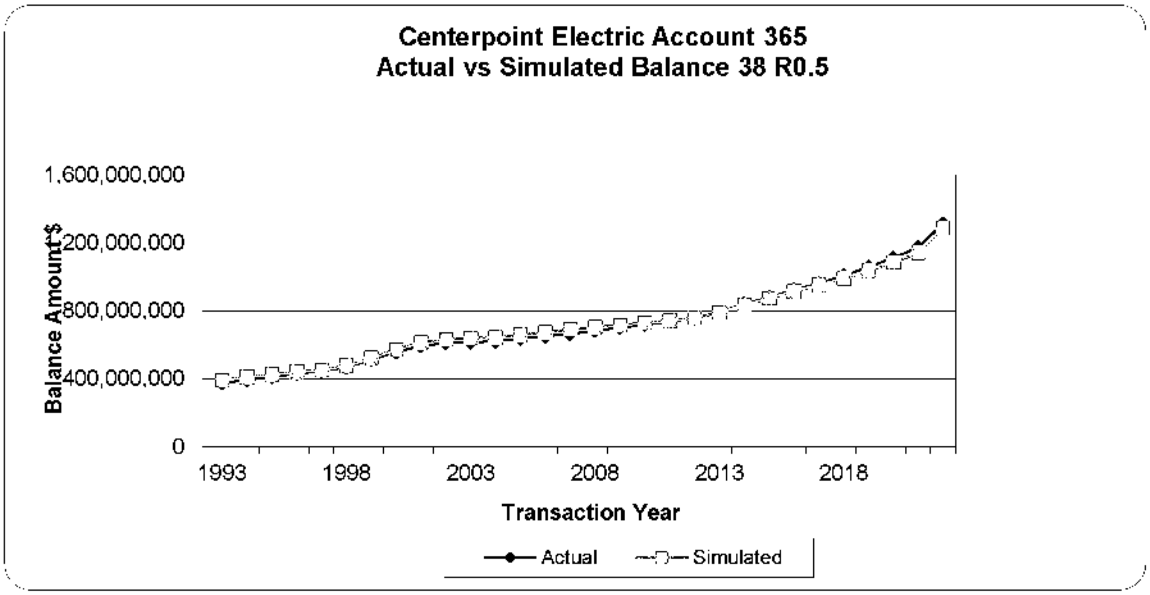
Account 365 Overhead Conductor/Devices (38 R0.5)

This account consists of overhead conductor of various diameters, as well as various switches and reclosers. The balance in this account is $1.3 billion. The approved life for this account is 38 years with the R0.5 dispersion.

In every SPR band (excluding short bands) examined, the R0.5 was the top ranked choice by CI, with REI of 100 in all bands except the 10 year band. In bands of 20 years and longer, the life for the R0.5 was shown as 38 years.

Discussions with Company engineers indicated that insulated wire lasts only as long as the insulation. While earlier-generation insulated wire was prone to failure, Company engineers estimate that the insulated wire now being used could allow current conductors to last up to 40 years. Other factors of retirement include lightning strikes, wind, and automobile strikes to poles. Along the coast, conductor will see enhanced degradation. Pitting and age also contribute to retirements. Load growth will retire a portion of the conductor earlier than physical conditions would require. Sensors, motors, and sectionalizing equipment are now seen on pole tops. These electronic devices would have a short life and are beginning to move the life shorter. Company SMEs believe a life of 38-40 years is operationally reasonable based on the analysis and engineering judgment.

Considering all these factors, this study recommends retaining the 38-year life and the R0.5 dispersion for this account. A graph of the plot of the actual versus observed balances for the chosen life and dispersion is shown below.


Centerpoint Electric Account 365
Actual vs Simulated Balance 38 R0.5
1,600,000,000
1,200,000,000
800,000,000
400,000,000
0
Balance Amount $
1993
1998
2003
2008
2013
2018
Transaction Year
Actual
Simulated

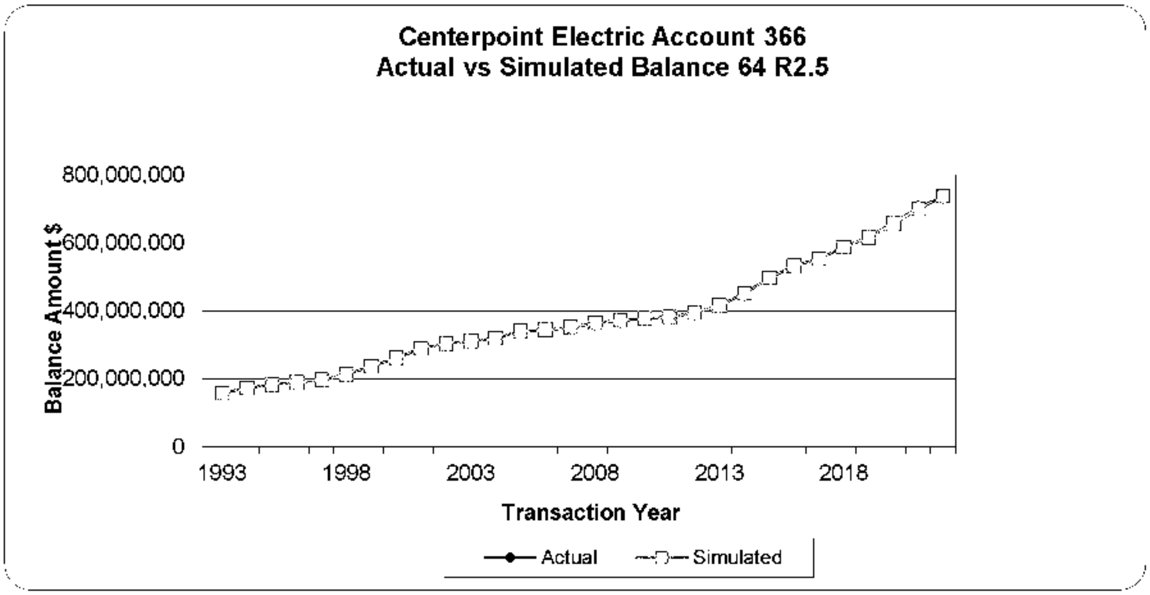
<u>Account 366 Underground Conduit (64 R2.5)</u>

This account consists of distribution conduit, duct banks, vaults, manholes, and ventilating system equipment. The balance in this account is $736.3 million. The approved life for this account is 62 years with the R2.5 dispersion.

In performing SPR analysis, the 64 R2.5 was in the top 10 highest ranked curves with excellent CI and REI in nearly every band examined, from 10 years to 100+ years in width. While other curves had a higher CI, the REIs did not approach 100.

Discussions with Company engineers indicated non-commercial underground ("UG") conduit was originally direct buried, then the Company switched to putting underground conductor into PVC conduit, and then 5+ years ago stopped putting new conductor in conduit. Direct buried conductor is Cross Linked Polyethylene ("XLPE"). Generally, the Company will abandon conduit in place (perhaps not always for commercial). Manholes would be partially removed (at minimum) and filled. The Company has not made any operational changes that would materially change the life expectations. Company SMEs report that they did not start using PVC until the early 1970s. Three phase are all concrete encased. Some fiber and tile conduit are in concrete in earlier installations. Residential (single phase) conductor is direct buried. Road widening, growth, and other "non-failure" factors are major causes of retirements. First 4 foot of manhole is removed and void filled with sand when retired. Company SMEs report that they will also pull cable if possible. From an operations perspective, Company SMEs agree that a slight move to a 64 year life is reasonable.

The existing 62-year life is slightly lower than Company engineers' expectations and what is demonstrated in the statistical analysis. This study recommends moving to the 64 R2.5. A graph of the plot of the actual versus observed balances for the chosen life and dispersion is shown below.


Centerpoint Electric Account 366
Actual vs Simulated Balance 64 R2.5
800,000,000
600,000,000
400,000,000
200,000,000
0
Balance Amount $
1993
1998
2003
2008
2013
2018
Transaction Year
Actual
Simulated

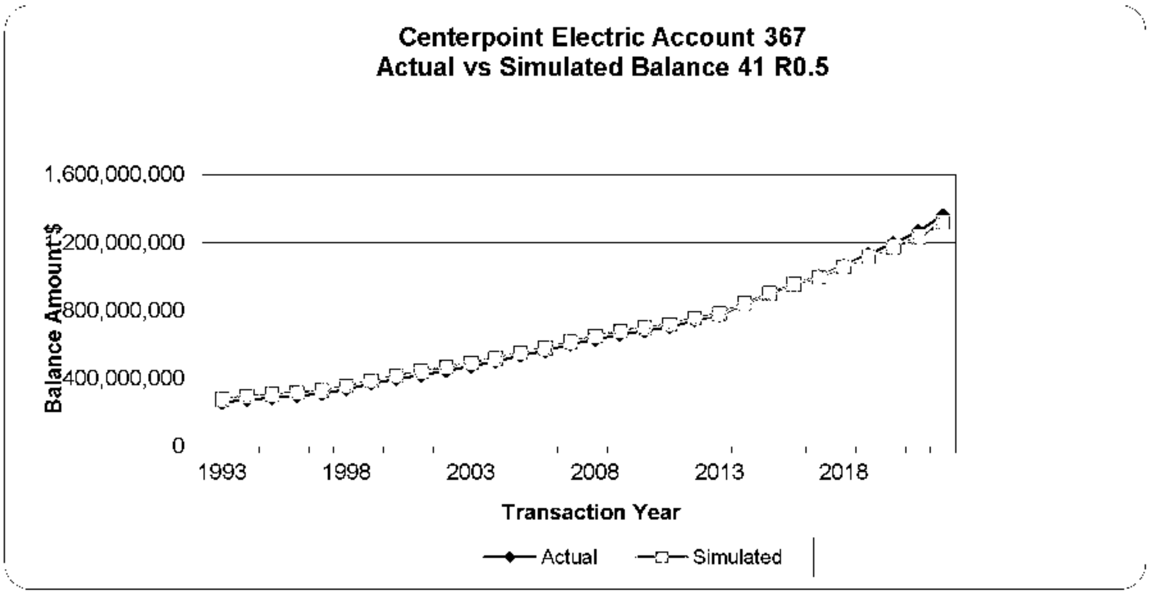
Account 367 Underground Conductor/Devices (41 R0.5)

This account consists of distribution conductor, circuit breakers, insulators, and switches. The balance in this account is $1.4 billion. The approved life for this account is 38 years with the R0.5 dispersion.

With the exception of the most recent bands of 30 years and longer, the top ranked curve was a 41 R0.5 for each band analyzed. While the CIs were not in the excellent range, the REI in each instance was 100.

Discussions with Company engineers indicated they would expect UG conductor to not last as long as UG conduit in Account 366. They believe the UG conductor life is increasing because of newer technology in cable (XLPE). Company SMEs report that XLPE is more well protected and overall better than older technology. If abandoning in place, operations will just cut the end. If replacing cable in conduit, pulling conductor out would be removal cost. They will remove reachable cable when abandoning direct buried cable in place. As they move more to XLPE, they would expect the life to continue to increase. Company SMEs state that their rule of thumb is to expect 35-40 years for UG conductor. Due to load growth and resiliency plans, their capital spending was higher than many other years. Two programs are causing a shift from OH and to UG. Operations focused on some dedicated UG feeders (some as old as from the 1980s). Cable installed in the 1980s is now suspect, and much of it will be replaced. They use XLP in single phase but not for three phase. Primary situations use Propylene Rubber (EPR) and XLP for all else (e.g., lateral to customer). Causes of failure in this account are road widenings, dig-ins, customer growth, reconfiguration, and other causes. Company SMEs recommend that a slight increase in life is reasonable based on operational factors.

Based on the analysis and discussions with Company engineers, this study recommends moving to a 41-year life while maintaining the R0.5 dispersion for this account. A graph of the plot of the actual versus observed balances for the chosen life and dispersion is shown below.



Account 368 Line Transformers (29 R0.5)

This account consists of pad-mount and line transformers, regulators, and capacitors. The balance in this account is $1.7 billion. The approved life for this account is 28 years with the R1 dispersion.

In the SPR analysis with band widths from 30 years to 105 years, the R1 with a life of 29 years was the top ranked curve with excellent REI. Narrower bands were not given weight in the analysis.

Company engineers indicated that there are both pad-mount and line transformers on the system that are roughly equal in quantity across the system. Overload, lightning surge, cars hitting poles, and growth will affect the life of line transformers. Overloads, lightning surges, termination point issues, and ants (and other animals) affect the life of pad-mount transformers. Dead front pad-mount transformers (i.e., non-energized front) are the current standard, but there are still a number of live front transformers in service too. If a failure in a line occurs, the Company will evaluate other equipment in the loop and may replace live front transformers at the same time in order to bring the transformer up to current standards. Company SMEs report that OH transformers are longer lived (would last longer than 29 years) but the pad transformers will not last 29 years.

There is less cooling in residential pad mount transformers than overhead – the heating will significantly reduce the life of pad mount transformers. Major UG focuses exclusively on commercial three phase loads and has different issues than residential settings. Changing customer demand would be a large driver for commercial although the largest driver for outdoor transformers is due to rust, leaking, and other external factors. The life of the equipment is impacted by changes in customers or change in load patterns. Chemicals, yard treatments, etc. would also affect pad mount transformers. Company SMEs have recently moved from mild steel to stainless steel (started in 2021) and they would expect a longer life to be start being seen in the next