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Exhibit Number:	TURN-7
Witness:	David J. Garrett

PREPARED TESTIMONY OF DAVID J. GARRETT

ADDRESSING THE PROPOSALS OF PACIFIC GAS AND ELECTRIC COMPANY IN ITS TEST YEAR 2020 GENERAL RATE CASE RELATED TO DEPRECIATION RATES

Submitted on Behalf of

THE UTILITY REFORM NETWORK

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I. INTRODUCTION

Q. State your name and occupation.

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

Q. Summarize your educational background and professional experience.

A. I received a B.B.A. with a major in Finance, an M.B.A., and a Juris Doctor from the University of Oklahoma. I worked in private legal practice for several years before accepting a position as assistant general counsel at the Oklahoma Corporation Commission in 2011, where I worked in the Office of General Counsel in regulatory proceedings. In 2012, I began working for the Public Utility Division as a regulatory analyst providing testimony in regulatory proceedings. In 2016, I formed Resolve Utility Consulting, PLLC, where I have represented various consumer groups and state agencies in utility regulatory proceedings, primarily in the areas of cost of capital and depreciation. I am a Certified Depreciation Professional with the Society of Depreciation Professionals. I am also a Certified Rate of Return Analyst with the Society of Utility and Regulatory Financial Analysts. A more complete description of my qualifications and regulatory experience is included in my curriculum vitae.[1]

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[1] Exhibit DJG-1.

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

A. I am testifying on behalf of The Utility Reform Network ("TURN") regarding the depreciation rates proposed by Pacific Gas & Electric Company ("PG&E" or the "Company") in this proceeding. My testimony addresses the depreciation study performed by Gannett Fleming Valuation and Rate Consultants, LLC ("Gannett Fleming") and the testimony of Company witness Ned W. Allis, who sponsors the depreciation study.

II. EXECUTIVE SUMMARY

Q. Summarize the key points of your testimony.

A. In this case, PG&E is requesting a substantial increase in depreciation expense of $508 million (a 22% increase to the 2017 figure), with $38.1 million of that increase the result of the proposed changes to depreciation rates.[2] My review of the Company's depreciation study revealed many unreasonable assumptions and positions. As discussed in my testimony, the Company has the burden to make a convincing showing that its proposed depreciation rates are reasonable, and while some aspects of the depreciation study may be reasonable, the evidence presented in this testimony demonstrates that the Company has failed to meet its burden regarding several key issues. As a result, the Company's proposed depreciation rates should not be accepted as filed, as they would result in an unreasonably high depreciation expense charged to customers. My analysis of the depreciation study in this case consisted of employing a well-established depreciation system and using actuarial analysis to statistically analyze the Company's depreciable assets to develop reasonable

[2] PG&E-10, p. 10-3, lines 1-2, and 10-7, line 3.

depreciation rates. I applied my estimates of average service life and salvage to the Company's plant and reserve balances as of December 31, 2017. The table below compares the proposed depreciation accruals as of the study date.[3]

Figure 1:
Depreciation Accrual Comparison by Plant Function

Division / Function	Plant 12/31/2017	PG&E Proposal Rate	PG&E Proposal Accrual	TURN Proposal Rate	TURN Proposal Accrual	TURN Adjustment Rate	TURN Adjustment Adjustment
Electric Division							
Intangible	$ 118,062,168	2.86%	$ 3,374,140	2.52%	$ 2,971,391	-0.34%	$ (402,748)
Production	5,935,225,737	3.29%	195,124,165	3.29%	195,124,165	0.00%	(0)
Transmission	410,076,700	2.67%	10,937,814	2.25%	9,233,636	-0.42%	(1,704,178)
Distribution	28,413,750,969	4.24%	1,204,301,802	3.56%	1,011,387,443	-0.68%	(192,914,359)
General	470,111,106	5.85%	27,479,454	5.85%	27,479,454	0.00%	(0)
Total Electric Division	$ 35,347,226,681	4.08%	$ 1,441,217,375	3.53%	$ 1,246,196,089	-0.55%	$ (195,021,286)
Gas Division							
Intangible	$ 13,610,858	47.40%	$ 6,451,672	8.90%	$ 1,211,521	-38.50%	$ (5,240,151)
Production	507,239	1.75%	8,900	1.75%	8,900	0.00%	0
Local Storage	16,347,040	2.53%	413,338	2.53%	413,338	0.00%	(0)
Distribution	10,141,235,114	3.20%	324,931,547	2.41%	244,369,398	-0.79%	(80,562,149)
General	312,563,139	4.35%	13,604,486	4.35%	13,604,486	0.00%	0
Total Gas Division	$ 10,484,263,390	3.29%	$ 345,409,944	2.48%	$ 259,607,644	-0.82%	$ (85,802,299)
Common Division	$ 6,243,975,518	8.92%	$ 557,067,760	6.90%	$ 431,014,355	-2.02%	$ (126,053,404)
Total Plant Studied	**$ 52,075,465,588**	**4.50%**	**$ 2,343,695,078**	**3.72%**	**$ 1,936,818,089**	**-0.78%**	**$ (406,876,989)**

Applying reasonable and conservative adjustments to PG&E's proposed depreciation rates would result in an adjustment reducing the Company's proposed depreciation accrual by $407 million – applied to plant balances at December 31, 2017.[4]

[3] *See also* Exhibit DJG-2.

[4] Note that the dollar figures presented in this table and throughout my testimony relate to plant balances as of December 31, 2017, which do not necessarily reflect the amount of depreciation expense that will be charged through rates. Presenting these dollar amounts provides a direct comparison to the depreciation accruals presented in the depreciation study as of December 31, 2017.

Q. Summarize the primary factors driving your adjustment.

A. My overall adjustment to PG&E's proposed depreciation rates is driven by several key issues, as follows:

1. Several of the service lives proposed by the Company for its mass property accounts are too short given the Company's own historical data. In conducting his service life analysis in this case, Mr. Allis relied too heavily on Gannet Fleming's own version of the Company's historical data, which consistently resulted in shorter survivor curves than what were derived from the Company's real historical data. Objective Iowa curve analysis reveals that the Company's estimated service lives are unreasonably short for several accounts, which results in unreasonably high depreciation expense for ratepayers.

2. The Company provided virtually no evidence to support its service life proposal of only five years for its software accounts, which results in a proposed annual depreciation expense of more than $192 million. I present evidence showing that the average service life of these accounts should be at least 10 years, which is the service life I recommend.

3. The Commission has expressed an interest in gradualism concerning increasing negative net salvage rates imposed on customers. Pursuant to the Commission's guidelines, I propose net salvage adjustments to several of the Company's mass property accounts. For several other accounts, Mr. Allis admittedly disregarded recent and relevant net salvage data when conducting his net salvage analysis. This error resulted in net salvage rates being underestimated (i.e., more negative) than otherwise indicated by the recent historical data.

The table below summarizes the difference in PG&E's and TURN's proposed depreciation parameters proposed in this case.[5]

[5] *See also* Exhibit DJG-3.

Figure 2:
Depreciation Accrual Comparison by Plant Function

		Current Parameters			PG&E Proposal			TURN Proposal		
		Net	Iowa Curve		Net	Iowa Curve		Net	Iowa Curve	
Account No.	Description	Salvage	Type	AL	Salvage	Type	AL	Salvage	Type	AL
	ELECTRIC PLANT									
303.03	COMPUTER SOFTWARE	0%	SQ -	5	0%	SQ -	5	0%	SQ -	10
353.02	STATION EQUIPMENT - SUT	-5%	R1.5 -	55	-5%	R1.5 -	55	-5%	R1.5 -	61
353.03	STATION EQUIPMENT - SUT CC	-5%	R1.5 -	55	-5%	R1.5 -	55	-5%	R1.5 -	61
355.00	POLES AND FIXTURES	-80%	R1.5 -	52	-80%	R1.5 -	52	-80%	R1.5 -	58
362.00	STATION EQUIPMENT	-40%	R1.5 -	46	-60%	R1.5 -	46	-45%	R1.5 -	52
364.00	POLES, TOWERS AND FIXTURES	-150%	R1.5 -	44	-175%	R1.5 -	44	-156%	R2 -	51
365.00	OH CONDUCTORS AND DEVICES	-125%	R2 -	46	-100%	R2 -	46	-86%	R2 -	52
366.00	UG CONDUIT	-50%	R4 -	62	-50%	R4 -	62	-50%	R4 -	70
367.00	UG CONDUCTORS AND DEVICES	-65%	R3 -	47	-80%	R3 -	47	-80%	R3 -	54
368.01	LINE TRANSFORMERS - OH	-30%	R2.5 -	32	-40%	R2.5 -	32	-33%	R2.5 -	34
369.01	SERVICES - OVERHEAD	-125%	R2.5 -	52	-125%	R2.5 -	52	-125%	R2.5 -	59
369.02	SERVICES - UNDERGROUND	-45%	R4 -	45	-45%	R4 -	45	-45%	R4 -	53
370.01	METERS	-15%	R1.5 -	20	-20%	R2 -	20	-20%	R2 -	20
	GAS PLANT									
303.02	SOFTWARE	0%	SQ -	5	0%	SQ -	5	0%	SQ -	10
376.01	MAINS	-55%	R3 -	57	-55%	R3 -	57	-40%	R3 -	57
378.00	M&R STATION EQUIPMENT	-35%	R2 -	55	-40%	R2 -	55	-40%	R2 -	59
380.00	SERVICES	-124%	R3 -	57	-100%	R3 -	57	-44%	R3 -	60
381.00	METERS	-50%	S1 -	28	-50%	S1 -	28	-50%	S1 -	30
383.00	HOUSE REGULATORS	-10%	R2 -	28	-15%	R2 -	28	-15%	R2 -	28
	COMMON PLANT									
303.02	SOFTWARE	0%	SQ -	5	0%	SQ -	5	0%	SQ -	10

Q. What is your recommendation in this case?

A. I recommend the Commission adopt the depreciation rates presented in Exhibit DJG-4.

III. LEGAL STANDARDS

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

A. In *Lindheimer v. Illinois Bell Telephone Co.*, the U.S. Supreme Court stated that "depreciation is the loss, not restored by current maintenance, which is due to all the factors causing the ultimate retirement of the property. These factors embrace wear and tear, decay, inadequacy, and obsolescence."[6] The *Lindheimer* Court also recognized that the original cost of plant assets, rather than present value or some other measure, is the proper basis for calculating depreciation expense.[7] Moreover, the *Lindheimer* Court found:

> [T]he company has the burden of making a convincing showing that the amounts it has charged to operating expenses for depreciation have not been excessive. That burden is not sustained by proof that its general accounting system has been correct. The calculations are mathematical, but the predictions underlying them are essentially matters of opinion.[8]

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

Q. Should depreciation represent an allocated cost of capital to operationS, rather than a mechanism to determine loss of value?

A. Yes. While the *Lindheimer* case and other early literature recognized depreciation as a necessary expense, the language indicated that depreciation was primarily a mechanism to determine loss of value.[9] Adoption of this "value concept" would require annual appraisals of extensive utility plant and is thus not practical in this context. Rather, the "cost allocation concept" recognizes that depreciation is a cost of providing service, and that in addition to receiving a "return on" invested capital through the allowed rate of return, a

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

[7] *Id*. Referring to the straight-line method, the *Lindheimer* Court stated that "[a]ccording to the principle of this accounting practice, the loss is computed upon the actual cost of the property as entered upon the books, less the expected salvage, and the amount charged each year is one year's pro rata share of the total amount." The original cost standard was reaffirmed by the Court in *Federal Power Commission v. Hope Natural Gas Co.*, 320 U.S. 591, 606 (1944). The *Hope* Court stated: "Moreover, this Court recognized in [*Lindheimer*], supra, the propriety of basing annual depreciation on cost. By such a procedure the utility is made whole and the integrity of its investment maintained. No more is required."

[8] *Id*. at 169.

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

utility should also receive a "return of" its invested capital in the form of recovered depreciation expense. The cost allocation concept also satisfies several fundamental accounting principles, including verifiability, neutrality, and the matching principle.[10] The definition of "depreciation accounting" published by the American Institute of Certified Public Accountants ("AICPA") properly reflects the cost allocation concept:

> Depreciation accounting is a system of accounting that aims to distribute cost or other basic value of tangible capital assets, less salvage (if any), over the estimated useful life of the unit (which may be a group of assets) in a systematic and rational manner. It is a process of allocation, not of valuation.[11]

Thus, the concept of depreciation as "the allocation of cost has proven to be the most useful and most widely used concept."[12]

IV. ANALYTIC METHODS

Q. Discuss your approach to analyzing the Company's depreciable property in this case.

A. I obtained and reviewed all the data that was used to conduct the Company's depreciation study. The depreciation rates proposed by Mr. Allis were developed based on depreciable property recorded as of December 31, 2017. I used the same plant balances to develop my proposed depreciation rates.

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

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

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

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

A. The legal standards set forth above do not mandate a specific procedure for conducting depreciation analysis. These standards, however, direct that analysts use a system for estimating depreciation rates that will result in the "systematic and rational" allocation of capital recovery for the utility. Over the years, analysts have developed "depreciation systems" designed to analyze grouped property in accordance with this standard. A depreciation system may be defined by several primary parameters: 1) a method of allocation; 2) a procedure for applying the method of allocation; 3) a technique of applying the depreciation rate; and 4) a model for analyzing the characteristics of vintage property groups.[13] In this case, I used the straight line method, the average life procedure, the remaining life technique, and the broad group model to analyze the Company's actuarial data. This depreciation system conforms to the legal standards set forth above and is commonly used by depreciation analysts in regulatory proceedings. I provide a more detailed discussion of depreciation system parameters, theories, and equations in Appendix A.

Q. Did you and Mr. Allis use the same depreciation system?

A. Yes. Mr. Allis and I essentially used the same depreciation system to develop our proposed depreciation rates. Thus, the discrepancy in our positions is due to differing opinions or interpretations of the data regarding service life and net salvage parameters.

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[13] *See* Wolf *supra* n. 9, at 70, 140.

V. SERVICE LIFE ANALYSIS

Q. Describe the actuarial process you used to analyze the Company's depreciable property.

A. The study of retirement patterns of industrial property is derived from the actuarial process used to study human mortality. Just as actuarial analysts study historical human mortality data to predict how long a group of people will live, depreciation analysts study historical plant data to estimate the average lives of property groups. The most common actuarial method used by depreciation analysts is called the "retirement rate method." In the retirement rate method, original property data, including additions, retirements, transfers, and other transactions, are organized by vintage and transaction year.[14] The retirement rate method is ultimately used to develop an observed life table ("OLT") which shows the percentage of property surviving at each age interval. This pattern of property retirement is described as a "survivor curve." The survivor curve derived from the OLT, however, must be fitted and smoothed with a complete curve in order to determine the ultimate average life of the group. The most widely used survivor curves for this curve fitting process were developed at Iowa State University in the early 1900s and are commonly known as the "Iowa curves."[15] A more detailed explanation of how the Iowa curves are used in the actuarial analysis of depreciable property is set forth in Appendix C.

I used the aged property data provided by the Company to create an OLT for each account. The data points on the OLT can be plotted to form a curve (the "OLT curve").

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

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

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

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

A. Not necessarily. Mathematical fitting is an important part of the curve-fitting process because it promotes objective, unbiased results. However, while mathematical curve fitting is important, it may not always yield the optimum result. For example, if there is insufficient historical data in a particular account and the OLT curve derived from that data is relatively short and flat, the mathematically "best" curve may be one with a very long average life. However, when there are sufficient data available, mathematical curve fitting can be used as part of an objective service life analysis.

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

A. Not necessarily. Many analysts have observed that the points comprising the "tail end" of the OLT curve may often have less analytical value than other portions of the curve. In fact, "[p]oints at the end of the curve are often based on fewer exposures and may be given less weight than points based on larger samples. The weight placed on those points will depend on the size of the exposures."[16] In accordance with this standard, an analyst may decide to truncate the tail end of the OLT curve at a certain percent of initial exposures, such as one percent. Using this approach puts a greater emphasis on the most valuable portions of the curve. For my analysis in this case, I not only considered the entirety of the OLT curve, but also conducted further analyses that involved fitting Iowa curves to the most significant part of the OLT curve for certain accounts. In other words, to verify the accuracy of my curve selection, I narrowed the focus of my additional calculation to consider the top 99% of the "exposures" (*i.e.*, dollars exposed to retirement) and to eliminate the tail end of the curve representing the bottom 1% of exposures for some accounts, if necessary. However, I should also note that for every account discussed below (i.e., the accounts to which I propose service life adjustments), the Iowa curves proposed

[16] Wolf *supra* n. 9, at 46.

by the Company fit the observed data so poorly that the Iowa curves I propose provide a better fit to the observed data for every account, no matter which portion of the OLT curve is analyzed (i.e., the full OLT curve or the top 99% based on exposures).

Q. Generally, describe the differences between the Company's service life proposals and your service life proposals.

A. For each of these accounts discussed below, the Company's proposed service life, as estimated through Iowa curves, is too short to accurately describe the mortality characteristics of the account in my opinion. For most of the accounts in which I propose a longer service life, such proposal is based on the objective approach of choosing an Iowa curve that provides a better mathematical and/or visual fit to the observed historical retirement pattern derived from the Company's plant data.

Q. Briefly describe the mathematical curve fitting process.

A. When conducting a mathematical curve-fitting analysis, it is important to consider the most mathematically relevant portions of the OLT curve. While visual curve fitting techniques help identify the most statistically relevant portions of the OLT curve for this account, mathematical curve fitting techniques can help us determine which of the two Iowa curves provides the better fit. Mathematical curve fitting essentially involves measuring the distance between the OLT curve and the selected Iowa curve. The best fitting curve is the one that minimizes the distance between the OLT curve and the Iowa curve, thus providing the closest fit. The "distance" between the curves is calculated using the sum-of-squared differences ("SSD") technique.

Q. Do you have any general criticisms of the approach Gannet Fleming took in the depreciation study regarding service life estimates?

A. Yes. According to Mr. Allis, the Simulated Plant Record ("SPR") Method was used in previous studies due to the lack of aged data necessary to conduct actuarial analysis.[17] In the current depreciation study, however, aged data is available for statistical analysis.[18] It is undisputed that aged data is generally superior to unaged data in terms of analytical value. Mr. Allis, however, states that the aged data in this case "were also supplemented by additional years of statistically aged data. . . ."[19]

Q. What is the problem with Gannet Fleming statistically aging its own historical data in this case?

A. There are several problems with Gannet Fleming's fabricating its own historical data in this case. First, Iowa curve analysis involves taking known data from the past, which is found in the utility's property records, and using Iowa curves as an objective way to use that past information to project future retirement rates. In other words, what has happened in the past should be based on fact, while projections of the future may be based on opinion, that is, objective opinions supported through Iowa curve analyses. In this case, however, Gannet Fleming unduly relies upon its own unsupported opinions about what occurred in the past – a procedure which was not necessary in this case. Moreover, PG&E's procedure has resulted in much higher depreciation rate proposals than what would have otherwise occurred if Gannet Fleming had simply relied upon PG&E's real historical data without

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[17] PG&E-10, p. 11-26, lines 1-31.

[18] *Id*.

[19] *Id*.

any unnecessary alterations. These tactics fall far short of the requisite "convincing showing" the Company must make to establish that its proposed rates are not excessive.

Q. What data did you primarily rely upon when conducting your Iowa curve analyses?

A. I primarily relied upon the Company's actual historical retirement data instead of Gannet Fleming's fabricated data.

Q. Do you have any reason to doubt the accuracy or objectivity of Gannet Fleming's fabricated data?

A. Yes. In Public Service Company of Oklahoma's ("PSO") 2017 rate case, there was an issue with Gannet Fleming altering the historical data in an account in the guise of the same type of "statistical aging" they are proposing in this case. Not only was the data altered, but it was altered in such a way that led to Gannet Fleming's fabricated OLT curve being much shorter than the company's real OLT curve. If one had accepted Gannet Fleming's fabrication of the historical data, it would have resulted in an increase to depreciation expense in excess of $4 million per year (a substantial amount for the account and utility in question), and a service life overestimated by about 20 years. Moreover, the judge in the PSO case agreed that the data fabrication was inappropriate:

> [I]t is clear that PSO's witness Mr. Spanos [of Gannet Fleming] made changes to the historic data in Account 367 and did not disclose these unusual changes. It is also clear that Mr. Spanos did not disclose that he had altered the data until the Attorney General had discovered the alteration and asked about it in discovery. The record shows that the difference between a 65-year average service life, which is what Mr. Spanos recommended in the prior case before altering the data, and the 45-year average service life Mr. Spanos recommends in this case after altering the data, is in excess of $4 million per year.[20]

Unlike the PSO case however, where the historical data was fabricated in only one account, in this case Gannet Fleming has fabricated historical data for every account. The main difference between the PSO case and this case is that Gannet Fleming has at least acknowledged that they fabricated the historical data in this case and that they are relying on that data in their service life analyses. In both cases though, Gannet Fleming's manipulation of the data resulted in OLT curves that were much shorter than the real OLT curves obtained from the utility's actual data.

Q. Regarding Gannett Fleming's fabricated data, did you observe any troubling patterns when compared with the Company's real data?

A. Yes. For each of the accounts to which I propose adjustments (and illustrated in the graphs below), all of the observed survivor curves derived from Gannett Fleming's fabricated data are shorter than the real OLT curves derived from the Company's actual data. In the graphs below, I show the Iowa curves I selected alongside the selection of Mr. Allis and the actual OLT curve. For several of the accounts discussed below, the Iowa curves I selected are longer than what would be indicated by the fabricated OLT curve, but shorter than what is otherwise indicated by the real OLT curve. The main difference between Gannet

[20] Final Order (No. 672864), Attach. 1, p. 28 of 239, entered 1-31-2018, Before the Oklahoma Corporation Commission, Cause No. PUD 201700151.

Fleming's service life analysis and my service life analysis in this case is this: My opinions are based on facts (the real OLT curves); Gannet Fleming's opinions are based on other Gannet Fleming opinions (the fabricated OLT curves).

Q. Did Gannet Fleming base their service life analysis on anything besides their own opinions inherent in the fabricated historical data?

A. Apparently yes. The depreciation study contains short narrative discussions for each account regarding service life and net salvage. Many of these discussions refer to "discussions with management" and other Company personnel.

Q. Do you have reservations about placing too much analytical value on discussions with Company management?

A. Yes, utility depreciation witnesses, such as Mr. Allis here, often attempt to bolster their positions by referring to their discussions with utility personnel about the utility's property. There are several obvious problems with these scenarios. First, this is an evidentiary proceeding. In discovery, I asked for all pertinent information regarding site visits and discussions with Company personnel and, therefore, presumably have access to the same information Mr. Allis relied upon.[21] If Gannet Fleming claims its service life estimates are superior because it was privy to pertinent information shared by Company personnel that was not made available to TURN, it would suggest PG&E intentionally withheld such information in discovery. Furthermore, there is a bigger problem. The applicant in this case has hired a third-party expert to give its opinions regarding the service life of the Company's assets – an issue that has a direct and significant impact on important financial

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[21] TURN Data Request TURN-PG&E-2 (Deprecation), Questions 10-11.

metrics to the Company's shareholders, such as cash flow and the revenue requirement. It does not make sense for that expert to place much reliance on the opinions of the very applicant who hired it. One metaphor that comes to mind is the seller of real property hiring an appraiser, and the appraiser turning around and asking the seller how much he thinks his property is worth or, after developing an estimate, asking the seller if he feels it is accurate or should be changed.[22] Another fitting metaphor would be a third-party return on equity expert asking a utility's CEO what she thinks the company's cost of equity should be. I have reviewed numerous cost of capital testimonies in utility rate proceedings and have never seen a utility ROE witness refer to opinions of utility management regarding its own cost of equity. Yet, I see essentially the same arrangement in nearly every testimony I read from utility depreciation witnesses. I am not suggesting that information obtained from Company management should be ignored entirely, but rather given less analytical consideration relative to the retirement data. To the extent feasible, service life estimates should be objectively based on unbiased facts – facts that are properly obtained from the utility's (real) historical data.

Q. Despite your criticisms of the elements of fabricated data and discussions with Company personnel, did you ignore those elements completely when conducting your service life analysis?

A. No. I considered all the information available to me when conducting my service life analysis. These factors include, but are not necessarily limited to, the Company's real aged data, my experience observing service life reviews and approvals in other jurisdictions, and

[22] If we took the metaphor a step further, the appraiser would not base his opinion on comparable sales, but rather "statistically-derived" sales that he created himself.

all information presented in Gannet Fleming's depreciation study, including the fabricated historical data and discussions with Company personnel. Ultimately, I considered all these factors in making professional judgments as to the most fair and reasonable service life estimates for each account. It is fair and accurate to say however, that I place more analytical value on the retirement rates indicated by the Company historical data than other factors that are more prone to biases, such as the opinions of Company personnel and Gannet Fleming's fabricated historical data. I do not propose service life or net salvage adjustments to many of the accounts presented in the depreciation study because, based on my review, I found Gannet Fleming's positions to be reasonable on those accounts. However, for the reasons discussed in my testimony, adjustments should be made to several accounts because the Company's proposed parameters for those accounts would, if adopted, result in excessively high depreciation rates and expense.

Q. Some of the Iowa curves you select below provide better fits to the real OLT curve than the Company's selected Iowa curve, yet are still shorter than the pattern indicated by the real OLT curve. Please explain.

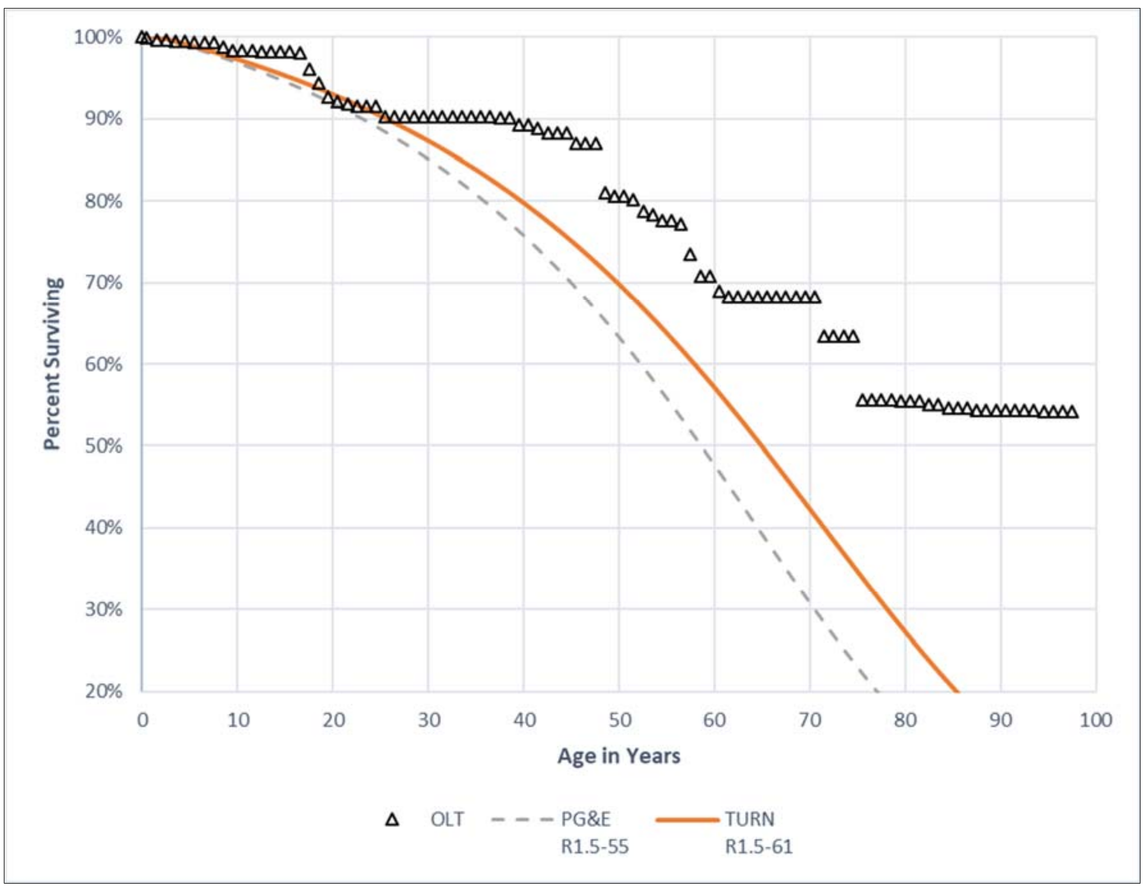
A. For several accounts discussed below, it is visually clear that the Iowa curve I selected provides a better fit to the real OLT curve than does the PG&E-selected curve. However, my Iowa curve is nonetheless shorter than the pattern otherwise indicated by the real OLT curve for this account. This is due to the fact that I did not strictly rely on the best mathematically fitting Iowa curve in my analysis, but rather considered all of the information presented, including the factors outlined above. As a result, many of my Iowa curves fall in between Gannet Fleming's Iowa curve and the real OLT curve in terms of service life.

A. <u>Account 353.02 – Electric Transmission – Station Equipment</u>

Q. Describe your service life estimate for this account and compare it with the Company's estimate.

A. The real OLT curve derived from the Company's data for this account has adequate retirement history for Iowa curve analysis. For this account, Mr. Allis selected the R1.5-55 Iowa curve, and I selected the R1.5-61 Iowa curve. Both of these curves are in the "R" family of curves, which means the greatest rate of retirement in these Iowa curves occurs after (or to the right of) the average life. The average lives of these curves are indicated by the numbers after the dashes (55 and 61 in this case).

Figure 3:
Account 353.02 – Electric Transmission – Station Equipment



As shown in the graph, both selected Iowa curves have similar shapes, but the R1.5-55 curve is shorter. The primary purpose of Iowa curve fitting is to use historical retirement rates to accurately estimate future retirement rates. This means that the selected Iowa curves should be reflective of the retirement pattern already observed in the account (as seen in the OLT curve). For this account, the R1.5-55 curve selected by Mr. Allis has little resemblance to the observed data. To conclude that the R1.5-55 curve is a reasonable selection by the Company would effectively ignore the purpose of the Iowa curve fitting process all together. Similar criticisms could even be applied to the Iowa curve I selected, which is clearly shorter than the pattern indicated by the real OLT curve. Nonetheless, the R1.5-61 curve I selected is the more reasonable choice between the two Iowa curves presented.

Q. Does the R1.5-55 curve selected by Mr. Allis even provide a good fit to Gannet Fleming's own fabricated data?

A. No. Not only is the R1.5-55 curve far too short to be a good fit to the real OLT curve, but it is also too short to be a good fit for Gannet Fleming's fabricated data, as can be clearly seen in the depreciation study.[23]

Q. Does the Iowa curve you selected provide a better mathematical fit to the OLT curve for this account?

A. Yes. The visually clearer fit illustrated in the graph above can also be confirmed mathematically. For this account, the SSD, or "distance" between the Company's curve and the OLT curve, is 7.7718 and the SSD between the R1.5-61 curve and the OLT curve

[23] PG&E-10, WP 11-405.

is only 4.6222 when the tail-end of the OLT curve is not considered in the calculation.[24] Thus, the R1.5-61 curve is a better mathematical fit to relevant portions of the observed survivor curve. For this reason and those discussed above, the Iowa curve I selected results in a more reasonable (and perhaps overly conservative) depreciation rate.

Q. Did you consider any information presented in PG&E's depreciation study as compelling evidence in support of the Company's proposed service life?

A. No. The depreciation study provides a brief discussion of some of the forces of retirement for the assets in this account, but the Company's proposed service life is essentially based on "discussions with management" and Gannet Fleming's fabricated data.[25] As discussed above, I do not believe either of these factors amount to adequate or convincing support for the Company's proposed service lives. For example, the study notes that "40 years is a reasonable average life for most circuit breakers."[26] Any supposed value of that information, however, depends on the evidence supporting it. In this case, the evidence is simply "discussions with Company management," which is essentially no evidence at all without further objective support.[27] The actual average lives of the various assets in Account 353.01 should be reflected in the Company's historical retirement data. This is not unlike the data used by insurance actuaries to estimate human lives. For example, one could ask a doctor on how long he believes humans survive, on average. The doctor may be an expert on human anatomy and physiology and might provide his best guess on human

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[24] Exhibit DJG-6.

[25] PG&E-10, WP 11-390.

[26] *Id*.

[27] *Id*.

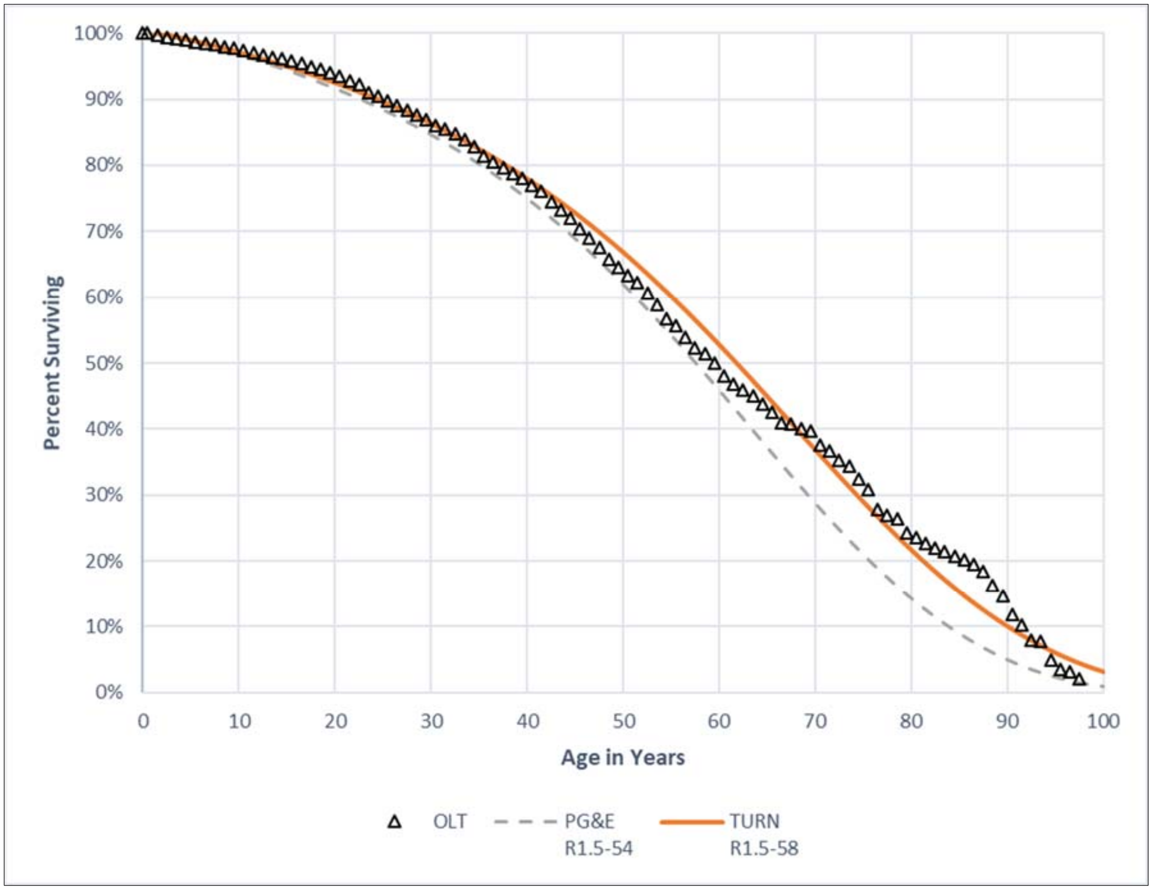
lifespans, but it would far better to ask this question of an insurance actuary who has access to massive amounts of human mortality data.

B. Account 355 – Electric Transmission – Poles and Fixtures

Q. Describe your service life estimate for this account and compare it with the Company's estimate.

A. The OLT curve for Account 355 is well suited for conventional Iowa curve fitting techniques. This is because the OLT curve is relatively smooth, has adequate retirement history (i.e., it is long enough), and forms the shape of a typical retirement pattern for utility property. I selected the R1.5-58 curve for this account and Mr. Allis selected the R1.5-54 curve. The graph below shows both Iowa curves along with the real OLT curve.

Figure 4:
Account 355 – Electric Transmission – Poles and Fixtures



One of the main purposes of Iowa curve fitting is to obtain a smooth, complete curve (i.e., reaches zero percent surviving) so that the remaining life can be calculated. Here, the real OLT curve is nearly complete. In this situation, the results of the mathematical curve fitting process can be particularly useful in determining the appropriate curve.

Q. What is the primary justification stated in the depreciation study for the use of the fabricated aged data?

A. According to the depreciation study, Gannet Fleming created its own version of the Company's aged data in order to get a "longer period of analysis than had only the aged data been used."[28]

Q. Do you agree with this rationale?

A. No. Conceptually I could agree that longer periods of analysis of reliable data are preferable for Iowa curve fitting, but Gannet Fleming's unsupported and fabricated data essentially adds no value to the process of estimating service lives in this case.

Q. Regardless of the differing opinions regarding the value of Gannett Fleming's fabricated data, was it even necessary for Account 355?

A. No. If the rationale behind Gannet Fleming's fabricated data is to have longer periods for analysis, that rationale would not apply to Account 355 because we have a nearly complete, real OLT curve to analyze.

Q. Does the fact that there is adequate real data in this account for Iowa curve analysis cast even further doubt on the reliability of Gannet Fleming's fabricated data?

A. Yes, clearly it does. The fact that Gannet Fleming believed it was necessary to concoct their own aged data for an account that did not need it is questionable, but predictably, the fabricated data yet again would result in a lower service life estimate and higher depreciation rate than what is otherwise indicated by the real data. In other words, even when the facts are sufficient (i.e., real data), Gannet Fleming inserted its opinion (i.e.,

[28] PG&E-10, p. 11-26, lines 25-26.

fabricated data) into the equation and it predictably resulted in a higher depreciation expense proposal.

Q. Is the Iowa curve selected by Mr. Allis shorter than the service life otherwise indicated by either the real OLT curve or the fabricated OLT curve?

A. Yes. Not only is the R1.5-54 curve too short to accurately describe the real observed data, but as with Account 353.02 discussed above, the Iowa curve selected by Mr. Allis is also too short to accurate fit his company's own fabricated data for this account. This can be clearly seen in the depreciation study.[29] As a result, the depreciation rate proposed by Mr. Allis for this account is unreasonably high.

Q. Does the Iowa curve you selected provide a better mathematical fit to the OLT Curve for this account?

A. Yes. The SSD for the curve selected by Mr. Allis is 0.4622, and the SSD for the R1.5-58 curve I selected is 0.0776.[30]

Q. Did you find any compelling evidence in the depreciation study in support of the Company's proposed service life for this account?

A. No. As with the account discussed above, the primary factors used in the depreciation study to justify the service life estimates are Gannet Fleming's discussions with the applicant who hired it in this case and Gannet Fleming's fabricated data. For example, the depreciation study notes that the "actuarial analysis indicates an average service life of around 55 years."[31] This statement is misleading however, because it is not referring to

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[29] PG&E-10, WP 11-435.

[30] Exhibit DJG-7.

[31] PG&E-10, WP 11-433.

PG&E's actual retirement data, but rather Gannet Fleming's manipulated data. As illustrated above, actuarial analysis of PG&E's real historical data strongly indicates an average service life closer to 58 years. The depreciation study also makes unsupported claims like "the recorded levels of retirements in some recent years . . . are fairly low and are not necessarily indicative of future experience."[32] Again, as illustrated above, we have a nearly complete OLT curve derived for PG&E's actual data that indicates an average service life of 58 years for this account. For every mass property account discussed in my testimony, Gannet Fleming essentially concludes, without support, that what has happened in the past is not indicative of what will happen in the future, and that what will happen in the future should result in shorter service life estimates than what is otherwise indicated in the Company's historical retirement data. These one-sided and unsupported conclusions fall far short of the Company's burden to make a convincing showing that its proposed rates are reasonable and not excessive.

C. <u>Account 362 – Electric Distribution – Station Equipment</u>

Q. Describe your service life estimate for this account and compare it with the Company's estimate.

A. The OLT curve for Account 362 is well suited for conventional Iowa curve fitting techniques. This is because the OLT curve is relatively smooth, has adequate retirement history, and forms the shape of a typical retirement pattern for utility property. For this account, I selected the R1.5-52 curve for this account and Mr. Allis selected the R1.5-46 curve. Both curves are shown in the graph below along with the real OLT curve.

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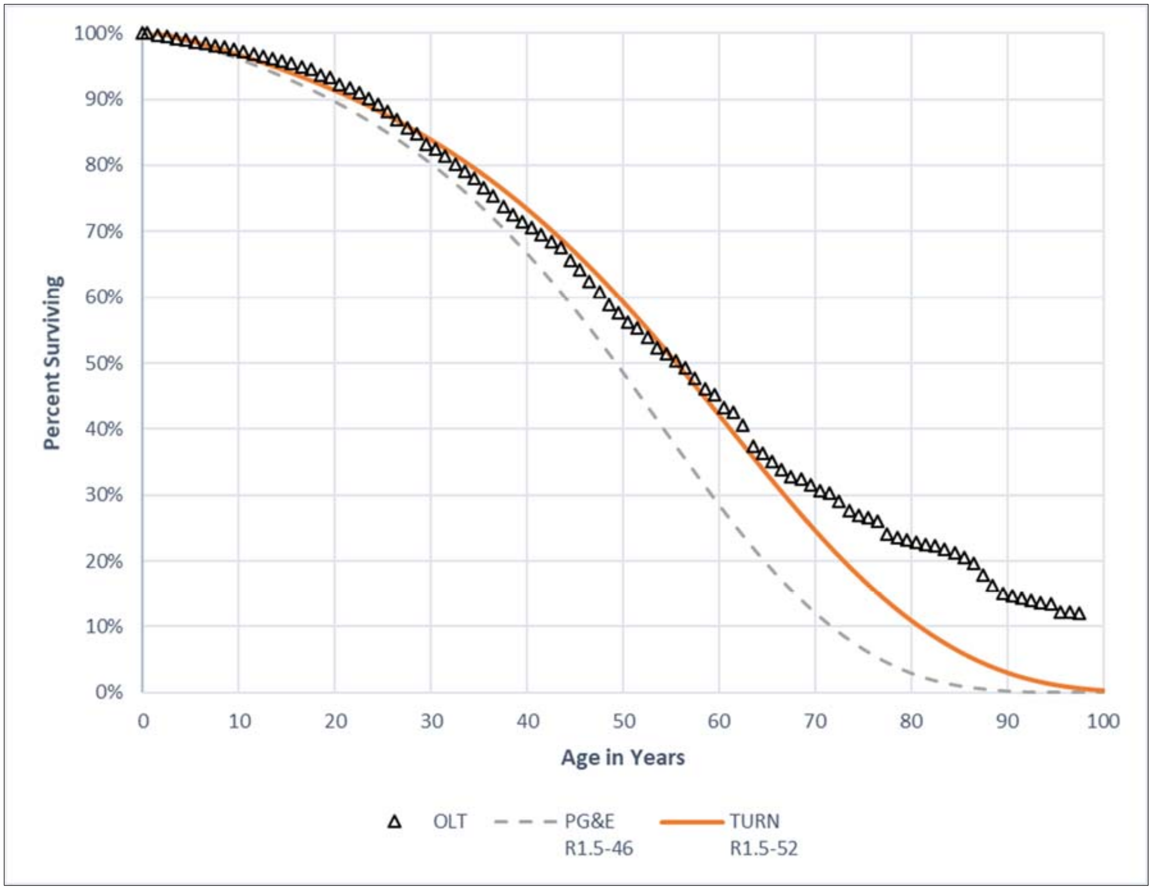
[32] PG&E 10, WP 11-433.

Figure 5:
Account 362 – Electric Distribution – Station Equipment



As with the previous accounts discussed above, it is clear that the Iowa curve selected by Mr. Allis is too short to accurately describe the observed retirement pattern in this account. As a result, PG&E's proposed depreciation rate for this account is unreasonably high.

Q. Does the R1.5-46 curve selected by Mr. Allis even provide a good fit to Gannet Fleming's own fabricated data for this account?

A. No. Not only is the R1.5-46 curve far too short to be a good fit to the real OLT curve, but it is also too short to be a good fit for Gannet Fleming's fabricated data, as can be clearly seen in the depreciation study.[33]

Q. Regardless of the rationale or accuracy behind Gannett Fleming's fabricated data, was it even necessary to conduct this procedure for Account 362?

A. No. There is adequate retirement history in Account 362 to conduct Iowa curve analysis on the real data. Even the OLT curve derived from Gannet Fleming's fabricated data is not that much different (though predictably shorter) than the real OLT curve.

Q. Does the Iowa curve you selected provide a better mathematical fit to the OLT Curve for this account?

A. Yes. The SSD for the curve selected by Mr. Allis is 1.7251, and the SSD for the R1.5-52 curve I selected is 0.5245.[34]

Q. Did you find any compelling evidence in the depreciation study in support of the Company's proposed service life for this account?

A. No. Despite the fact that PG&E's own historical retirement data strongly indicates an average service life of at least 52 years for this account, "discussions with management" and analysis of Gannet Fleming's fabricated data has led to a proposed service life of only 46 years. It is both concerning and revealing that in nearly every instance where Gannet

[33] PG&E-10, WP 11-522.

[34] Exhibit DJG-8.

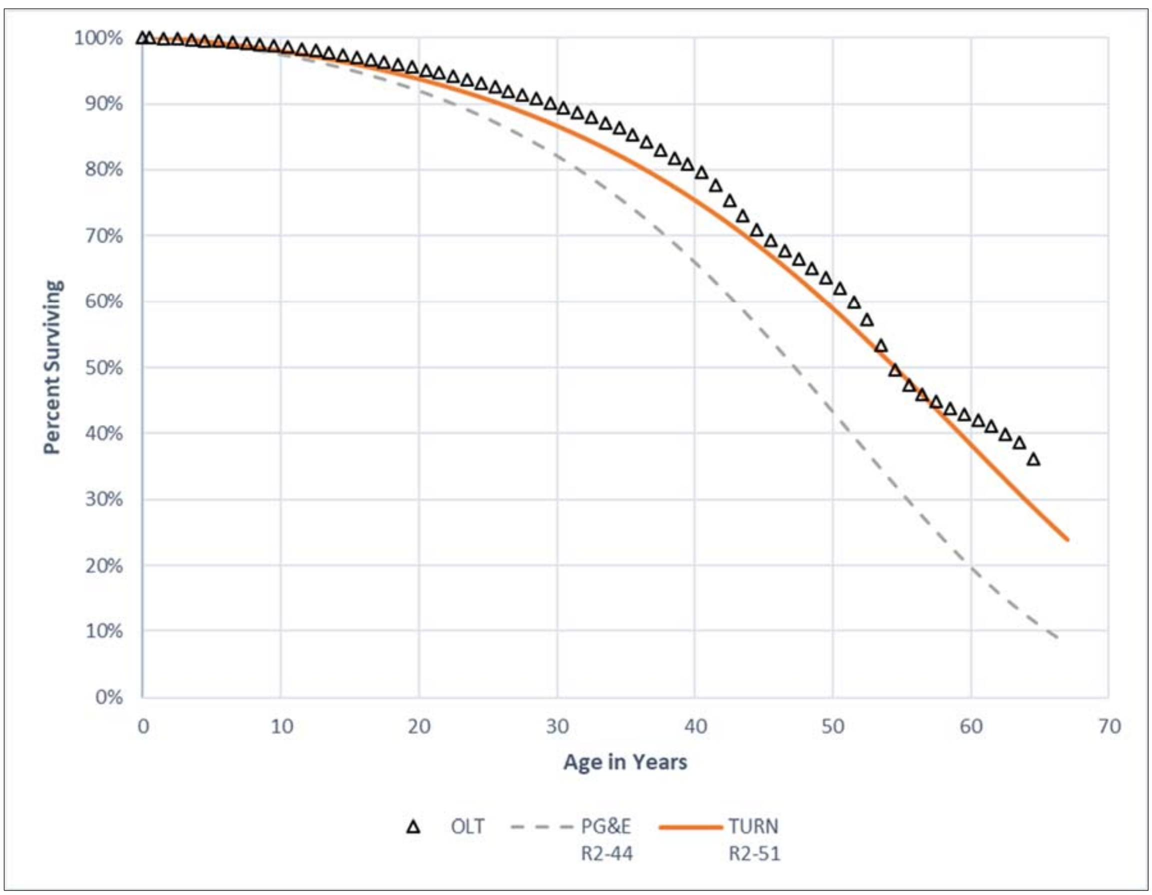
Fleming had discussions with Company management, those discussions led to service life estimates that are shorter than those otherwise indicated by PG&E's own unbiased data.

D. <u>Account 364 – Electric Distribution – Poles, Towers and Fixtures</u>

Q. Describe your service life estimate for this account and compare it with the Company's estimate.

A. As with the accounts discussed above, the real OLT curve for Account 364 is ideal for conventional Iowa curve fitting techniques. For this account, Mr. Allis selected the R2-44 curve and I selected the R2-51 curve. Both Iowa curves are shown in the graph below along with the real OLT curve.

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



As shown in the graph, the curve selected by Mr. Allis is too short to provide an accurate fit to the observed data in this account. Again, the primary value of Iowa curve fitting is having an objective way to use past information in order to accurately project future retirement patterns. That value is lost, however, when an Iowa curve fails to accurately describe what has already happened (i.e., historical data). In other words, an Iowa curve cannot accurately predict the future without first accurately describing the past. The R2-44 curve selected by Mr. Allis fails to do either. Describing the past should be relatively straight-forward since we are working with known data. In this case, however, Gannet Fleming chose to ignore the known data and fabricate their own data, resulting in unreasonably high depreciation rate proposals.

Q. Does the Iowa curve you selected provide a better mathematical fit to the observed data than the Company's curve?

A. Yes. Although it is clear from the graph above that the Iowa curve I selected provides the better fit, we can confirm that fact mathematically. The SSD for the Company's curve is 1.5340 and the SSD for the R2-51 curve I selected is only 0.1611, making it the better fit.[35]

Q. Did you find any compelling evidence in the depreciation study in support of the Company's proposed service life for this account?

A. No. As with most of the other accounts discussed in this section, Gannet Fleming makes references to the "statistical analysis" in support of its service life recommendations, and similarly claims that the "actuarial analysis indicates an average life of around 40 to 45

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[35] Exhibit DJG-9.

years. . . ."[36] This claim is disingenuous, however, since the actuarial analysis relied upon by Gannet Fleming relates the historical data created by Gannet Fleming, and not PG&E's actual, unadulterated data.

E. <u>Account 365 – Electric Distribution – Overhead Conductors and Devices</u>

Q. Describe your service life estimate for this account and compare it with the Company's estimate.

A. The real OLT curve for this account is ideal for conventional Iowa curve fitting techniques. It is puzzling why Gannet Fleming believed it necessary to fabricate its own historical data for this account when Company's real data is more than sufficient. The real OLT curve this account has adequate retirement history for Iowa curve analysis. For this account, Mr. Allis selected the R2-46 curve and I selected the R2-52 curve. Both Iowa curves are shown in the graph below along with the real OLT curve.

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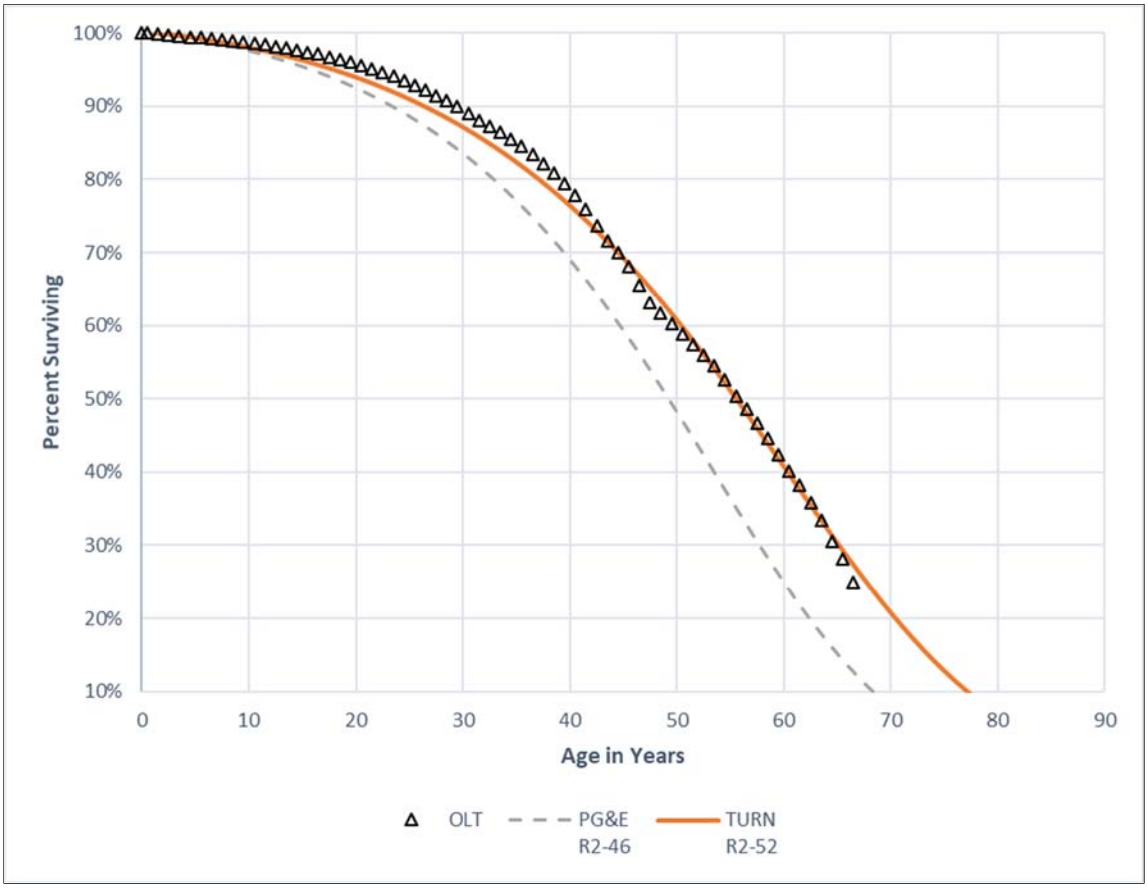
[36] PG&E-10, WP 11-544.

Figure 7:
Account 365 – Electric Distribution – Overhead Conductors and Devices



Once again, the Iowa curve selected by Mr. Allis is clearly too short to describe the observed, real data in this account.

Q. Regardless of the rationale or accuracy behind Gannett Fleming's fabricated data, was it even necessary to conduct this procedure for Account 365?

A. No. There is adequate retirement history in this account to conduct Iowa curve analysis on the real data, as shown in the graph above. Iowa curve analyses is often done on much shorter "stub" OLT curves than the one derived for Account 365 in this case. Even the OLT curve derived from Gannet Fleming's fabricated data is not that much different (though predictably shorter) than the real OLT curve.

Q. Does the Iowa curve you selected provide a better mathematical fit to the observed data than the Company's curve?

A. Yes. Although it is clear from the graph above that the Iowa curve I selected provides the better fit, we can confirm that fact mathematically. Specifically, the SSD for the Company's curve is 0.8762 and the SSD for the R2-52 curve I selected is only 0.1624, making it the better fit.[37]

Q. Did you find any compelling evidence in the depreciation study in support of the Company's proposed service life for this account?

A. No. As with the many of the other accounts discussed in this section, Gannet Fleming refers to "relatively low levels of retirements" in the 2000s or other time periods, with the inherent unsupported presumption that future retirements will be higher.[38] Statements like this might be more believable (though still unsupported) if I could find even one instance in the depreciation study where Gannet Fleming's predictions of the future result in longer estimated service lives in the present relative to the observed data.

F. Account 366 – Electric Distribution – Underground Conduit

Q. Describe your service life estimate for this account and compare it with the Company's estimate.

A. For this account, I selected the R4-70 curve and Mr. Allis selected the R4-65 curve. Both curves are shown in the graph below along with the real OLT curve.

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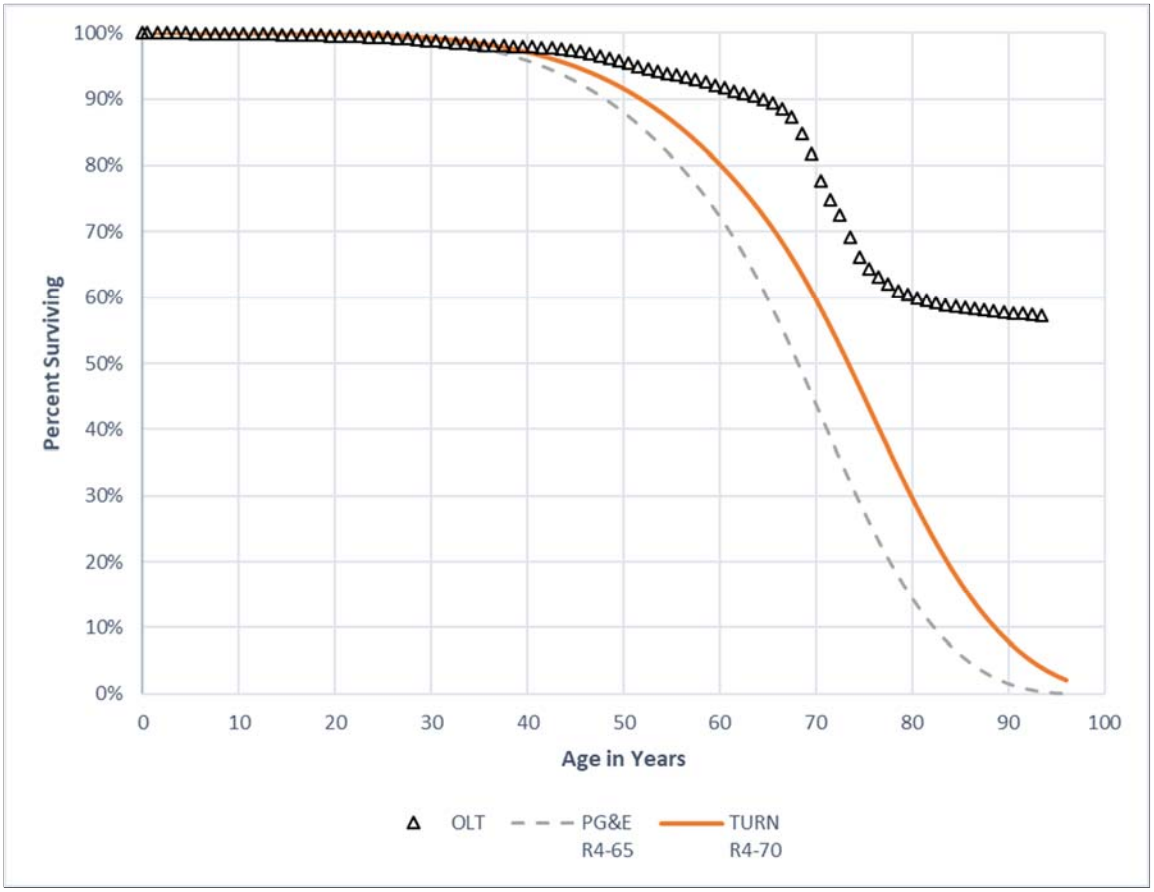
[37] Exhibit DJG-10.

[38] PG&E-10, WP 11-560.

Figure 8:
Account 366 – Electric Distribution – Underground Conduit



As with the previous accounts discussed above, it is clear that the Iowa curve selected by Mr. Allis is too short to accurately describe the observed retirement pattern in this account. As a result, PG&E's proposed depreciation rate for this account is unreasonably high.

Q. Does the R4-65 curve selected by Mr. Allis even provide a good fit to Gannet Fleming's own fabricated data for this account?

A. No. Not only is the R4-65 curve far too short to fit the real OLT curve, but it is also too short to fit Gannet Fleming's fabricated data, as can be clearly seen in the depreciation study.[39] Thus, even if the Commission were inclined to give any consideration to the historical "data" concocted by Gannet Fleming, we would still be left with essentially no evidence supporting the Company's proposed service life for this account – far short of the their legal burden to make a "convincing showing."[40]

Q. Does the Iowa curve you selected provide a better mathematical fit to the OLT Curve for this account?

A. Yes. The SSD for the curve selected by Mr. Allis is 7.5285, and the SSD for the R4-70 curve I selected is 4.4338.[41]

G. <u>Account 367 – Electric Distribution – Underground Conductors and Devices</u>

Q. Describe your service life estimate for this account and compare it with the Company's estimate.

A. For this account, I selected the R3-54 curve and Mr. Allis selected the R3-50 curve. Both curves are shown in the graph below along with the real OLT curve.

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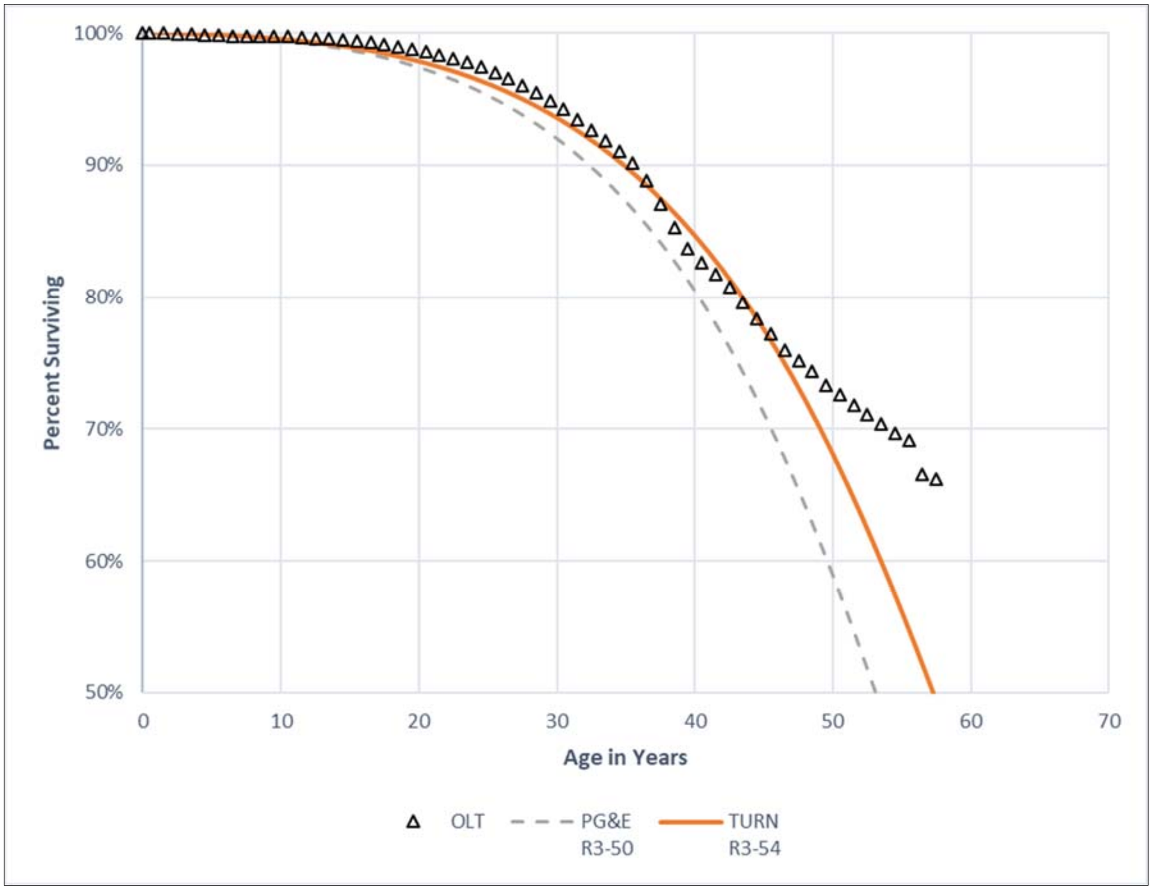
[39] PG&E-10, WP 11-576.

[40] *Lindheimer v. Illinois Bell Tel. Co.*, 292 U.S. 151, 169 (1934).

[41] Exhibit DJG-11.

Figure 9:
Account 367 – Electric Distribution – Underground Conductors and Devices



As shown in this graph, the R3-50 Iowa curve selected by Mr. Allis does not provide a good fit to the Company's actual historical retirement data, especially when compared to the R3-54 curve I selected. As a result, PG&E's proposed depreciation rate for this account is unreasonably high.

Q. Does the Iowa curve you selected provide a better mathematical fit to the OLT Curve for this account?

A. Yes. The SSD for the curve selected by Mr. Allis is 0.7597, and the SSD for the R3-54 curve I selected is 0.2187.[42]

Q. Did you find any compelling evidence in the depreciation study in support of the Company's proposed service life for this account?

A. No. As with the many of the other accounts discussed in this section, Gannet Fleming primarily relies on its own manufactured data in support of its service life estimate, though PG&E's actual retirement data indicates a longer service life estimate.[43]

H. <u>Account 368.01 – Electric Distribution – Line Transformers</u>

Q. Describe your service life estimate for this account and compare it with the Company's estimate.

A. The real OLT curve derived from the Company's historical data for this account is very well suited for Iowa curve fitting techniques. The real OLT curve is relatively smooth, complete, and forms the shape of a typical retirement pattern for utility property. In other words, it should be very straight forward to find a good-fitting Iowa curve for this account. I selected the R2.5-34 curve for this account, and Mr. Allis selected the R2.5-32 curve. Both curves are shown in the graph below along with the real OLT curve.

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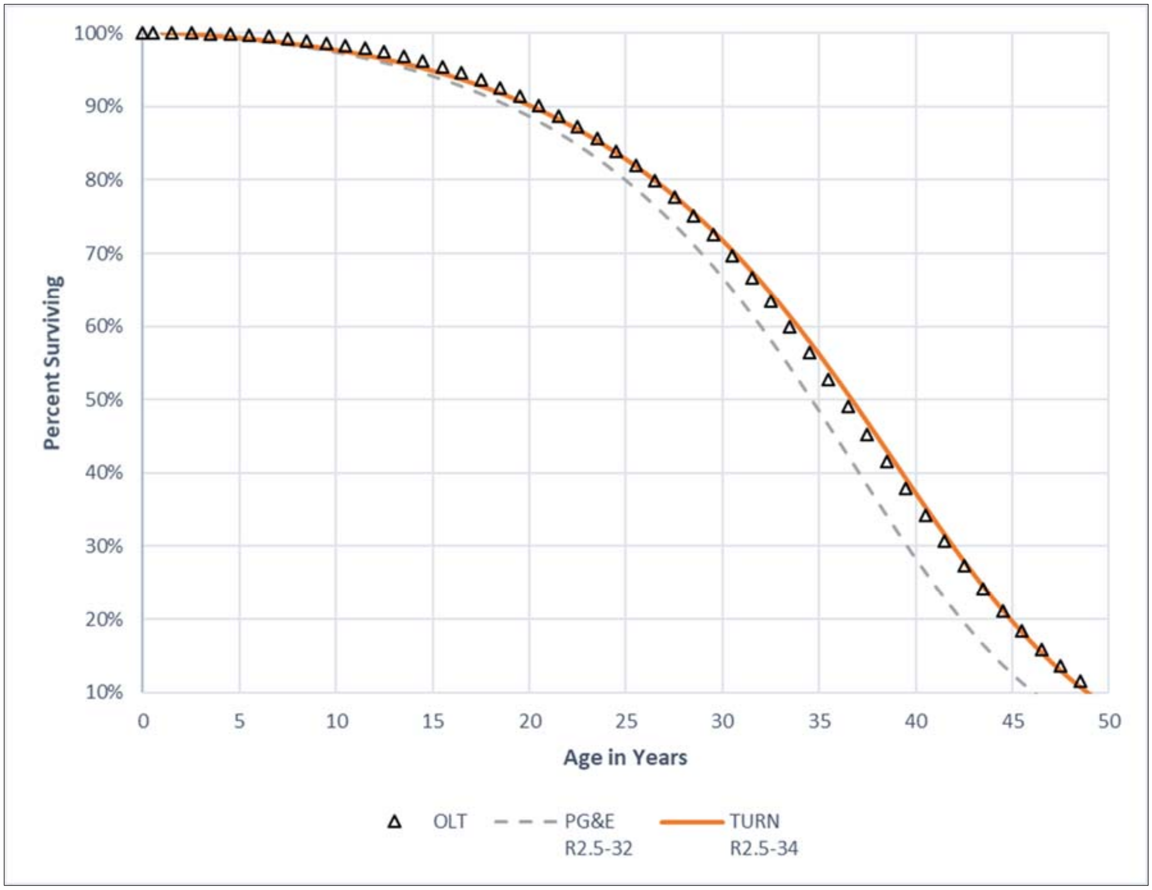
[42] Exhibit DJG-12.

[43] PG&E-10, WP 11-588.

Figure 10:
Account 368.01 – Electric Distribution – Line Transformers



Despite the fact that the real OLT curve for this account basically forms a perfect Iowa curve by itself, Mr. Allis nonetheless selected an Iowa curve that is one again too short to accurately describe the historical retirement experience in this account. Presumably, Mr. Allis is again basing his opinion on Gannet Fleming's fabricated data instead of using PG&E's real data.

Q. Regardless of the rationale or accuracy behind Gannett Fleming's fabricated data, was it even necessary to conduct this procedure for this account?

A. Clearly not. There is adequate retirement history in this account such that a nearly complete OLT curve is formed. Gannet Fleming has conducted depreciation analysis on the real data from other utilities that resulted in much shorter "stub" OLT curves than the OLT curve presented in this account.

Q. Does the Iowa curve you selected provide a better mathematical fit to the OLT Curve for this account?

A. Yes. The SSD for the curve selected by Mr. Allis is 0.3247, and the SSD for the R2.5-34 curve I selected is 0.0523.[44]

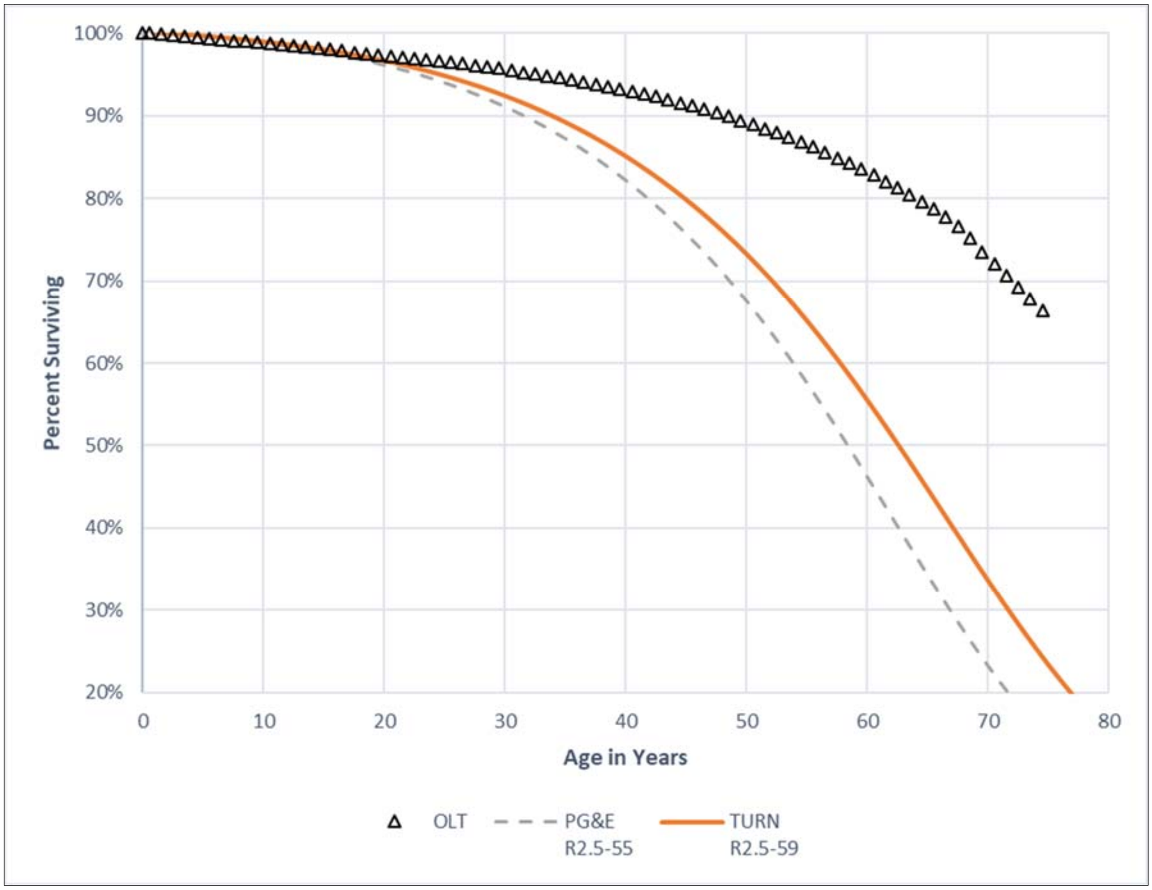
I. Account 369.01 – Electric Distribution – Overhead Services

Q. Describe your service life estimate for this account and compare it with the Company's estimate.

A. For this account, I selected the R2.5-59 curve and Mr. Allis selected the R2.5-55 curve. Both curves are shown in the graph below along with the real OLT curve.

[44] Exhibit DJG-13.

Figure 11:
Account 369.01 – Electric Distribution – Overhead Services



As with the previous accounts discussed above, it is clear that the Iowa curve selected by Mr. Allis is too short to accurately describe the observed retirement pattern in this account. As a result, PG&E's proposed depreciation rate for this account is unreasonably high.

Q. Does the R2.5-55 curve selected by Mr. Allis even provide a good fit to Gannet Fleming's own fabricated data for this account?

A. No. Not only is the R2.5-55 curve far too short to be a good fit to the real OLT curve, but it is also too short to be a good fit for Gannet Fleming's fabricated data, as can be clearly seen in the depreciation study.[45]

Q. Does the Iowa curve you selected provide a better mathematical fit to the OLT Curve for this account?

A. Yes. The SSD for the curve selected by Mr. Allis is 5.1947, and the SSD for the R2.5-59 curve I selected is 3.2333.[46]

J. <u>Account 369.02 – Electric Distribution – Underground Services</u>

Q. Describe your service life estimate for this account and compare it with the Company's estimate.

A. For this account, I selected the R4-53 curve and Mr. Allis selected the R4-50 curve. Both curves are shown in the graph below along with the real OLT curve.

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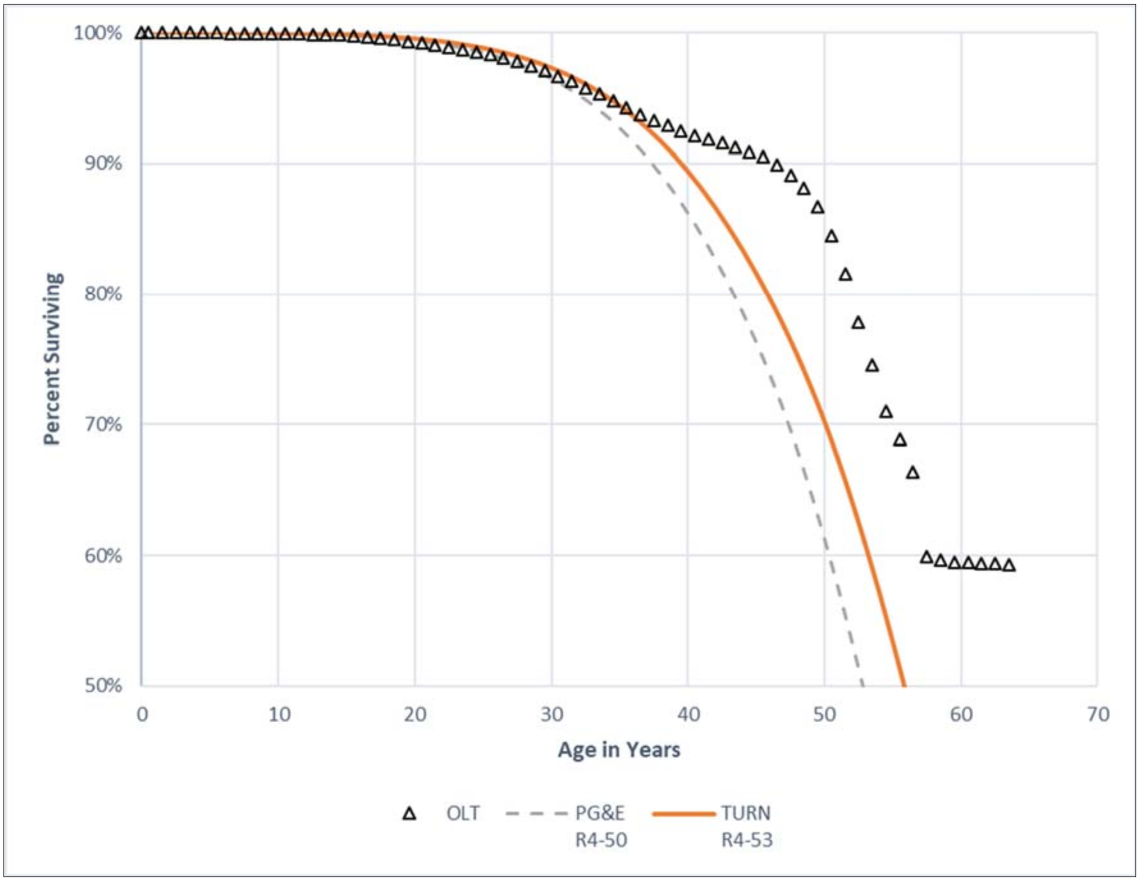
[45] PG&E-10, WP 11-620.

[46] Exhibit DJG-14.

Figure 12:
Account 369.02 – Electric Distribution – Underground Services



As with the previous accounts discussed above, it is clear that the Iowa curve selected by Mr. Allis is too short to accurately describe the observed retirement pattern in this account. As a result, PG&E's proposed depreciation rate for this account is unreasonably high.

Q. Does the Iowa curve you selected provide a better mathematical fit to the OLT Curve for this account?

A. Yes. The SSD for the curve selected by Mr. Allis is 2.6669, and the SSD for the R4-53 curve I selected is 1.3273.[47]

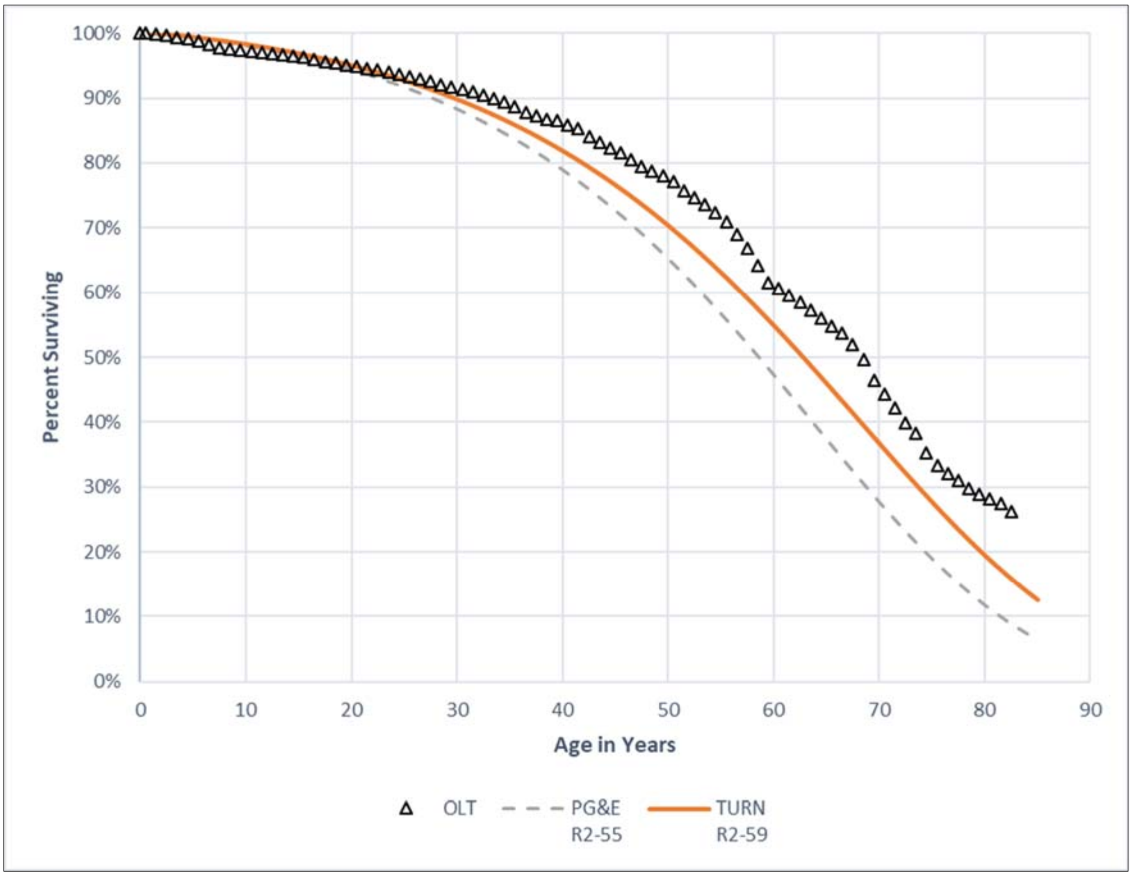
[47] Exhibit DJG-15.

K. <u>Account 378 – Gas Distribution – Measuring and Regulating Equipment</u>

Q. Describe your service life estimate for this account and compare it with the Company's estimate.

A. The real OLT curve for this account is well suited for Iowa curve fitting because it is relatively smooth, has adequate retirement history, and reflects a typical retirement pattern of utility property. I selected the R2-59 curve for this account and Mr. Allis selected the R2-55 curve. Both curves are shown in the graph below along with the real OLT curve.

Figure 13:
Account 378 – Gas Distribution – Measuring and Regulating Equipment



As with the previous accounts discussed above, it is clear that the Iowa curve selected by Mr. Allis is too short to accurately describe the observed retirement pattern in this account. As a result, PG&E's proposed depreciation rate for this account is unreasonably high.

Q. Does the R2.5-55 curve selected by Mr. Allis even provide a good fit to Gannet Fleming's own fabricated data for this account?

A. No. For this particular account, Gannet Fleming provides two additional fabricated OLT curves, yet the Iowa curve Mr. Allis selected is nonetheless shorter than any of the OLT curves presented. This can be clearly observed in the depreciation study.[48]

Q. Regardless of the rationale or accuracy behind Gannett Fleming's fabricated data, was it even necessary to conduct this procedure for this account?

A. No. There is adequate retirement history in this account. Gannet Fleming has conducted depreciation analysis on the real data from other utilities that resulted in much shorter "stub" OLT curves than the OLT curve presented in this account. In those cases, no fabricated OLT curve was presented or relied upon. The Company's actual historical data is more than sufficient for Iowa curve analysis, and that data indicates an average life notably higher than the one proposed by Mr. Allis.

Q. Does the Iowa curve you selected provide a better mathematical fit to the OLT Curve for this account?

A. Yes. The SSD for the curve selected by Mr. Allis is 1.3334, and the SSD for the R2-59 curve I selected is 0.4618.[49]

Q. Did you find any compelling evidence in the depreciation study in support of the Company's proposed service life for this account?

A. No. Predictably, Gannet Fleming's primary justification for its service life estimate for this account is related to "discussions with management" leading to a conclusion that future

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[48] PG&E-10, WP 11-827.

[49] Exhibit DJG-16.

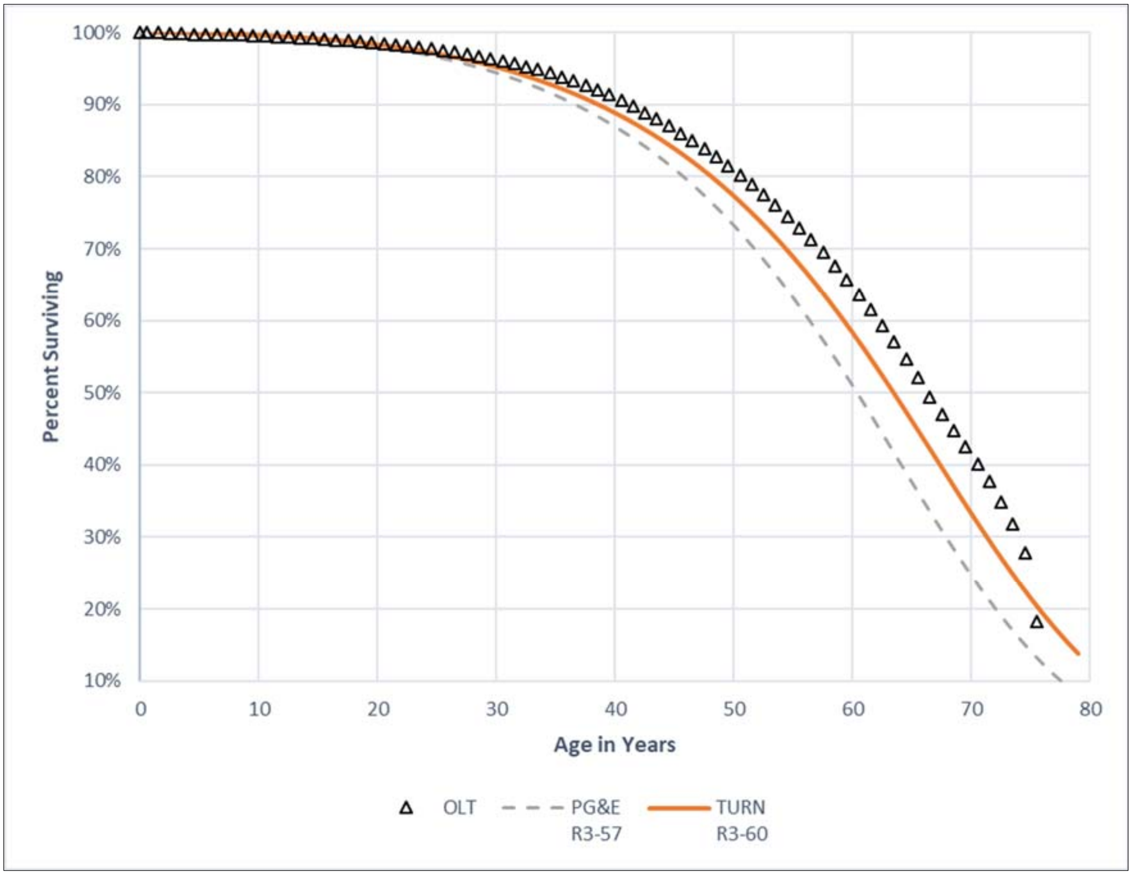
events will result in a shorter average service life than otherwise indicated by past events. What is more problematic is that the Iowa curve selected by Gannet Fleming for this account did not even provide a good fit to its own fabricated historical data. Thus, even if one were to give any analytical value to the data Gannet Fleming created in this case, there would still be no evidence on the record supporting their service life estimates, other than discussions with the Company that hired them to conduct an independent depreciation study.

L. Account 380 – Gas Distribution – Services

Q. Describe your service life estimate for this account and compare it with the Company's estimate.

A. The real OLT curve for this account is well suited for Iowa curve fitting because it is relatively smooth, has adequate retirement history, and reflects a typical retirement pattern of utility property. I selected the R3-60 curve for this account and Mr. Allis selected the R3-57 curve. Both curves are shown in the graph below along with the real OLT curve.

Figure 14:
Account 380 – Gas Distribution – Services



As with the previous accounts discussed above, it is clear that the Iowa curve selected by Mr. Allis is too short to accurately describe the observed retirement pattern in this account. As a result, PG&E's proposed depreciation rate for this account is unreasonably high.

Q. Does the R2.5-55 curve selected by Mr. Allis even provide a good fit to Gannet Fleming's own fabricated data for this account?

A. No. As with Account 378 discussed above, Gannet Fleming provides two additional fabricated OLT curves, yet the Iowa curve Mr. Allis selected is nonetheless shorter than any of the OLT curves presented. This can be clearly observed in the depreciation study.[50]

Q. Regardless of the rationale or accuracy behind Gannett Fleming's fabricated data, was it even necessary to conduct this procedure for this account?

A. No. The Company's actual historical data is more than sufficient for Iowa curve analysis, and that data indicates an average life notably higher than the one proposed by Mr. Allis.

Q. Does the Iowa curve you selected provide a better mathematical fit to the OLT Curve for this account?

A. Yes. The SSD for the curve selected by Mr. Allis is 0.8493, and the SSD for the R3-60 curve I selected is 0.2790.[51]

Q. Did you find any compelling evidence in the depreciation study in support of the Company's proposed service life for this account?

A. No. The depreciation study actually acknowledges that the "statistical analysis indicates a somewhat longer average service life than the currently authorized estimate . . ." and the "best fitting curves having average service lives of 60 years or more."[52] Instead of relying upon the retirement data, however, Gannet Fleming, decided not to increase the service life based on discussions with Company management and other factors external to the statistics.

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[50] PG&E-10, WP 11-843.

[51] Exhibit DJG-17.

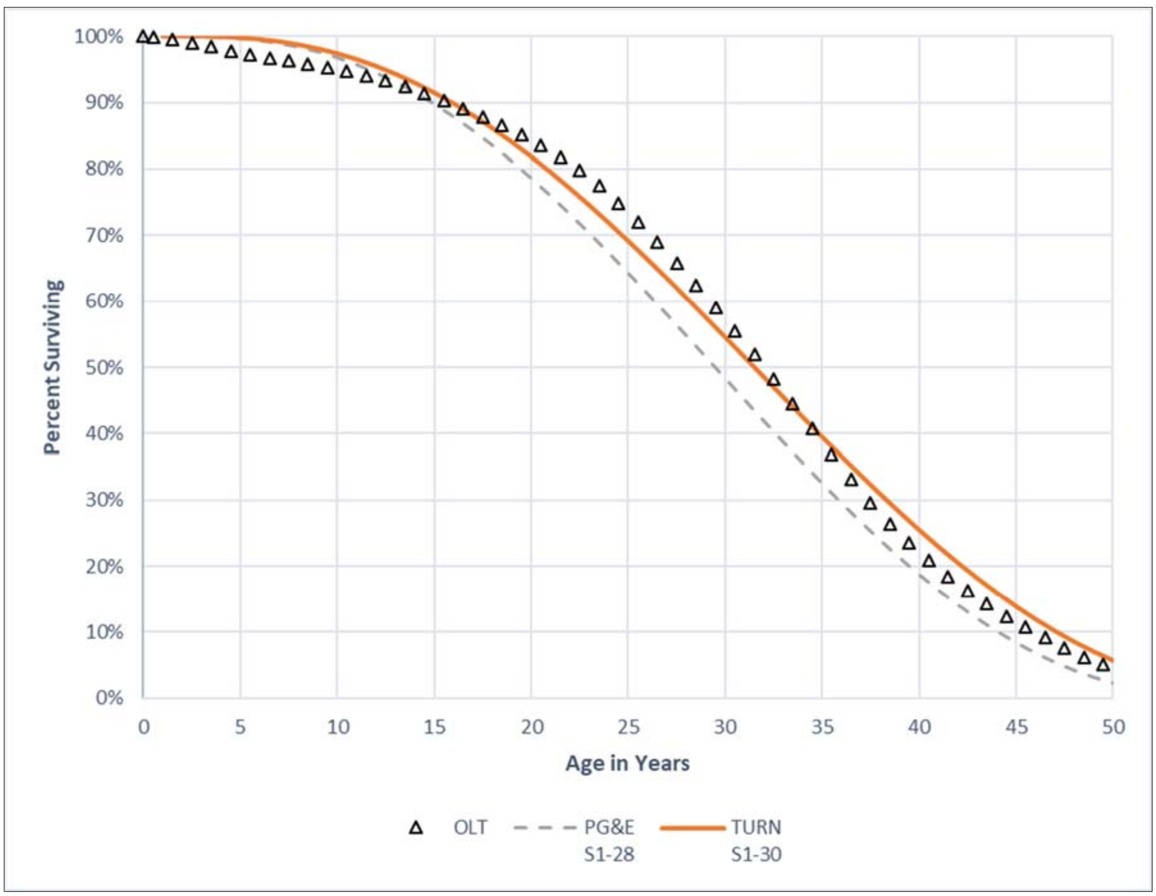
[52] PG&E-10, WP 11-841.

M. Account 381 – Gas Distribution – Meters

Q. Describe your service life estimate for this account and compare it with the Company's estimate.

A. The real OLT curve derived from the Company's historical data for this account is very well suited for Iowa curve fitting techniques. The real OLT curve is relatively smooth, complete, and forms the shape of a typical retirement pattern for utility property. In other words, it should be very straight forward to find a good-fitting Iowa curve for this account. I selected the S1-30 curve for this account, and Mr. Allis selected the S1-28 curve. Both curves are shown in the graph below along with the real OLT curve.

Figure 15:
Account 381 – Gas Distribution – Meters



Despite the fact that the real OLT curve for this account basically forms a perfect Iowa curve by itself, Mr. Allis nonetheless selected an Iowa curve that is one again too short to accurately describe the historical retirement experience in this account. Presumably, Mr. Allis is again basing his opinion on Gannet Fleming's fabricated data instead of using PG&E's real data.

Q. Regardless of the rationale or accuracy behind Gannett Fleming's fabricated data, was it even necessary to conduct this procedure for this account?

A. Clearly not. There is adequate retirement history in this account such that a nearly complete OLT curve is formed.

Q. Does the Iowa curve you selected provide a better mathematical fit to the OLT Curve for this account?

A. Yes. The SSD for the curve selected by Mr. Allis is 0.3492, and the SSD for the S1-30 curve I selected is 0.0949.[53]

N. Account 303 – Intangible Plant – Computer Software

Q. Describe the Company's proposed service life for its software accounts.

A. The Company maintains software accounts for its electric (303.03), gas (303.02) and common (303.02) plant divisions. The total amount of original cost in these three accounts is a substantial $1.1 billion. For each of these accounts, the Company proposes a service

[53] Exhibit DJG-18.

life of only five years.[54] The resulting depreciation expense PG&E proposes to charge to customers each year to recover its software costs is $192.7 million.[55]

Q. In general, describe the amount of information provided by the Company to support its proposed service life adjustments for its assets other than software.

A. Before further discussing the Company's software accounts, it is instructive to consider the amount of information provided by the Company in its application (and in discovery) in this case related to its service life proposals for its other mass property accounts. Although, as discussed above, I have many disagreements with positions taken in the depreciation study regarding service life estimates, including Gannet Fleming's reliance on fabricated data in its service life analysis, the Company nonetheless provided a considerable amount of data and information in attempts to support its positions. For many accounts (the accounts to which I do not propose adjustments) I believe the Company generally met its burden to make a convincing showing that its proposed depreciation rates were not excessive for those accounts. For the accounts to which I propose adjustments, I do not believe the Company met that burden, however, it nonetheless provided the sufficient data and information to be able to estimate an objective service life for those accounts.

Q. In contrast, describe the information provided by the Company in support of the five-year service life proposals for its software accounts.

A. The Company has essentially provided no support for the service life proposal of its software accounts. In Mr. Allis's testimony, there is no narrative discussion of software.

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[54] PG&E-10, pp. 11-3 thru 11-13.

[55] *Id*.

In the depreciation study, which is more than 1,000 pages, there are only a few sentences mentioning software. These sentences can be summarized as follows: PG&E is currently using a five-year service life and Company personnel say that is fine.[56] First, as discussed above, "discussions with Company personnel" or any related factor is not sufficient evidence on its face to support any service life, net salvage, or depreciation rate. If it were, there would be no need for regulation. It is not appropriate for the applicant in this case to hire a third-party expert to estimate its service lives, and the only evidence offered by the third-party expert in support of those service lives is "discussion with the applicant." If that were the case for every account, the entire depreciation study could be one paragraph long with a depreciation schedule attached. While the Company did not take such a patently unacceptable approach for the majority of its accounts, it did with its software accounts. If the plant balance in the Company's software accounts were immaterial, then such a casual approach to the lack of supporting evidence might not raise much concern. However, a plant balance of $1.1 billion and an annual depreciation expense of $192.7 million are far from immaterial.

Q. Did you ask for more information in discovery to give the Company another chance to provide some evidence for its software service life proposals?

A. Yes. I asked several discovery requests for the primary purpose of getting the Company to support its own service life proposals for its software accounts.[57]

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[56] PG&E-10, WP 11-1, 11-729, and 11-916.

[57] TURN-PG&E-46 (Depreciation)

Q. Did the Company respond to your discovery requests?

A. Yes. However, the information provided by the Company still provided no support for a five-year service life for software.

Q. Has PG&E met its burden to make a convincing showing that its proposed depreciation rates for its software accounts are not excessive?

A. No. Moreover, the Company has essentially made no showing at all regarding evidence to support its service life proposal for software.

Q. Do you agree with the Company's proposal regarding this account?

A. No. By selecting a five-year amortization period for its software accounts, the Company is suggesting that its software programs will last only five years, on average. On its face, spending hundreds of millions of dollars on assets that will last only five years is nonsensical. While a five-year service life estimate might be appropriate for basic consumer software systems, it is clearly insufficient to accurately describe the service life of major software systems at issue. Unlike basic consumer software systems, large enterprise software systems can be customized to the specific needs of the company. These modular systems require substantial upfront engineering costs along with periodic maintenance and support fees to ensure that the system performs reliably over a long period of time. For example, many utility companies rely on Enterprise Resource Planning ("ERP") systems comprising a suite of modular applications that collect and integrate data from different facets of the firm.

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

A. Yes. ERP systems are designed to provide long term solutions to companies. SAP is one of several providers of ERP systems.[58] According to a report by CGI Consulting Services, SAP systems can last 25 – 30 years.[59] Given the extremely high installation costs for these complex systems as well as the annual maintenance fees, it is not surprising that companies using ERP systems would demand that the systems last longer than 10 years.

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

A. Yes. Florida Power & Light ("FP&L") is one of many utilities that utilize ERP systems. In 2011, FP&L implemented SAP's ERP system to replace its previous accounting system.[60] FP&L had previously amortized its software over a five-year period. FP&L, however, requested that the amortization period be extended to 20 years in order to reflect the much longer lifespan of the new ERP system.[61] Kim Ousdahl, FP&L's Vice President, Controller and Chief Accounting Officer, gave the following testimony regarding FP&L's software account:

[58] SAP ERP is enterprise resource planning software developed by the German company SAP SE.

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

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

[61] *Id*.

> In 2011, the Company implemented a new general ledger accounting system (SAP) to replace its legacy system. . . . FPL's policy for accounting for new software requires . . . amortization on a straight-line basis over a period of five years, which is the current amortization period approved for this account. The Company is requesting to extend the amortization period of this system from five to twenty years in order to more appropriately recognize the longer benefit period expected from this major business system.[62]

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

Q. Has PG&E's depreciation witness recommended amortization periods up to 15 years for Account 303 in other depreciation studies?

A. Yes. Gannett Fleming has recommended average service lives ranging from 10-15 years in other cases.[63]

Q. Have you successfully argued for a 10-year service life for Account 303 in another case?

A. Yes. In Public Service Company of Oklahoma's ("PSO") 2017 rate case, the company proposed a five-year service life with essentially no evidence, as is the case here.[64] The Oklahoma commission found:

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[62] *Id*.

[63] *See* Petition of NSTAR Electric Company and Western Massachusetts Electric Company each d/b/a Eversource Energy for Approval of an Increase in Base Distribution Rates for Electric Service Pursuant to G.L. c. 164 § 94 and 220 C.M.R. § 500, Exhibit ES-JJS-6; see also Application of Oklahoma Gas and Electric Company, Cause No. PUD 201800140, Direct Testimony of John J. Spanos, filed December 31, 2018, Exhibit JJS-2, Table 1.

[64] Final Order (No. 672864), Attach. 1, p. 29 of 239, entered 1-31-2018, Before the Oklahoma Corporation Commission, Cause No. PUD 201700151.

> Mr. Garrett . . . recommended a 10-year amortization period instead of the 5-year amortization period PSO proposed [for Account 303]. Mr. Garrett's analysis was clear and convincing. . . . Based upon the evidence in the record, the Commission accepts the recommendation of Mr. David Garrett pertaining to Account 303.[65]

Relaying on similar arguments I present in this case, the Oklahoma commission found that a 10-year service life was clearly more appropriate than the five-year service life proposed by the company for its software accounts.

Q. What is your recommendation regarding PG&E's software accounts?

A. Again, the Company has presented <u>no</u> evidence to support its five-year service life estimate for software. In addition, I have presented evidence showing that the types of software programs included in Account 303 could last up to 20-30 years. In addition, Gannet Fleming has recommended service lives up to 15 years for this account in other cases. In light of this evidence, a service life of 15 years would be reasonable and supported by the record. However, I conservatively recommend an average service life of 10 years for the Company's software accounts. The remaining life and depreciation rate calculations are presented in my exhibits.[66]

VI. NET SALVAGE ANALYSIS

Q. Describe the concept of net salvage.

A. If an asset has any value left when it is retired from service, a utility might decide to sell the asset. The proceeds from this transaction are called "gross salvage." The

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[65] *Id*.

[66] *See* Exhibits DJG-19 – DJG-21.

corresponding expense associated with the removal of the asset from service is called the "cost of removal." The term "net salvage" equates to gross salvage less the cost of removal. Often, the net salvage for utility assets is a negative number (or percentage) because the cost of removing the assets from service exceeds any proceeds received from selling the assets. When a negative net salvage rate is applied to an account to calculate the depreciation rate, it results in increasing the total depreciable base to be recovered over a particular period of time and increases the depreciation rate. Therefore, a greater <u>negative</u> net salvage rate equates to a higher depreciation rate and expense, all else held constant.

Q. Has there been a trend in increasing negative net salvage in the utility industry?

A. Yes. As discussed above, negative net salvage rates occur when the cost of removal exceeds the gross salvage of an asset when it is removed from service. Net salvage rates are calculated by considering gross salvage and removal costs as a percent of the original cost of the assets retired. In other words, salvage and removal costs are based on current dollars, while retirements are based on historical dollars. Increasing labor costs associated with asset removal combined with the fact that original costs remain the same have contributed to increasing negative net salvage over time.

Q. Has the Commission expressed concern over increasing negative net salvage rates?

A. Yes. In PG&E's 2014 GRC, the Commission made it clear: "We remain concerned with the growing cost burden associated with increasing cost trends for negative net salvage."[67]

[67] Decision Authorizing Pacific Gas and Electric Company's General Rate Case Revenue Requirement for 2014-2016, D.14-08-032, p. 597

The Commission also expressed an interest in the ratemaking concept of gradualism. According to the Commission:

> In evaluating whether a proposed increase reflects gradualism, however, we believe the more appropriate measure is how the change affects customers' retail rates. The fact that PG&E previously proposed higher removal costs than adopted has no bearing on how a proposed change would impact current ratepayers. Accordingly, we apply the principle of gradualism based on how a proposed change in estimate compares to adopted costs reflected in current rates, irrespective of what PG&E may have forecasted in an earlier depreciation study.[68]

In PG&E's 2014 GRC, the Office of Ratepayer Advocates proposed a 25% cap on increased net salvage rates to mitigate sudden increases in net salvage and instead provide for more gradual levels of increases.[69] The Commission ultimately found: "As a general approach, we adopt no more than 25% of PG&E's estimated increases in the accrual provision for removal costs. This limitation tempers the impacts on current ratepayers. . . ."[70]

Q. Did you consider the Commission's concern for the growing cost burden associated with increasing negative net salvage when conducting your analysis?

A. Yes, and I agree with the Commission's concern. However, I did not apply a strict limit of 25% to the Company's proposed net salvage increases for every account – the main reason being that some of the net salvage adjustments called for under a strict 25% cap would be immaterial. More importantly, I want to focus the Commission's attention on three accounts in particular in which the Company did not propose increases to the current

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[68] *Id*. at 598.

[69] *Id*. at 592-93.

[70] *Id*. at 602.

net salvage rates, but current data suggests there should be a sizeable decrease (i.e., a less negative figure) in the net salvage rate.

Q. Please summarize your proposed net salvage adjustments.

A. In total, I am proposing net salvage adjustments to six of PG&E's accounts. For three of these accounts (362, 364, and 368.01), the adjustments were made pursuant to the Commission's guideline of applying a limit of 25% to proposed net salvage increases. The other three adjustments (see highlighted rows in the figure below) are based on technical analysis of the historical data, which is further discussed below. The follow table shows the current and proposed net salvage rates for these accounts.

Figure 16:
Net Salvage Adjustment Summary

Account No.	Description	Current NS %	PG&E NS %	TURN NS %
	ELECTRIC PLANT			
362.00	STATION EQUIPMENT	-40%	-60%	-45%
364.00	POLES, TOWERS AND FIXTURES	-150%	-175%	-156%
365.00	OH CONDUCTORS AND DEVICES	-125%	-100%	-86%
368.01	LINE TRANSFORMERS - OH	-30%	-40%	-33%
	GAS PLANT			
376.01	MAINS	-55%	-55%	-40%
380.00	SERVICES	-124%	-100%	-44%

My net salvage adjustments for the three highlighted accounts are further discussed below.

Q. Generally describe the net salvage adjustments you propose for accounts 365, 376.01, and 380.

A. For these three accounts, the Company either did not propose net salvage increases, or the increase that was proposed did not exceed the Commission's gradualism guidelines.

Rather, the Company simply took unreasonable positions regarding net salvage given the Company's historical data. Specifically, the Company's net salvage estimates were unreasonably high given the historical net salvage rates observed in recent years.

A. Account 365 – Overhead Conductors and Devices

Q. Describe the Company's net salvage proposal for Account 365.

A. According to the depreciation study, "[t]he more recent data supports a less negative net salvage estimate than the currently authorized (125) percent."[71] The depreciation study recommends a net salvage rate of -100%, but also admits this net salvage rate is "somewhat more negative than the more recent years" of data.[72]

Q. Do you agree with the Company's proposed net salvage rate for Account 365?

A. No. I agree that the more recent data supports a less negative net salvage rate than the currently authorized rate, however, the net salvage rate proposed in the depreciation study does not move far enough. The most recent five-year average net salvage is only -86%, which is much less than the Company's proposed net salvage of 100%.

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

A. I recommend a net salvage rate of -86%, which is equal to the most recent five-year average net salvage rate. The utility-reported data demonstrates a clear trend in recent years, and the utility has cited no reason why the Commission should not expect that trend to continue going forward.

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[71] PG&E-10, WP 11-560.

[72] *Id*.

B. <u>Account 376.01 – Mains</u>

Q. Describe the Company's net salvage proposal for Account 376.01.

A. The depreciation study recommends a net salvage rate of -100%.[73] The depreciation study acknowledges that the "most recent five-year average net salvage is (44) percent," but states it is "influenced by lower levels of cost of removal from 2012-2016."[74]

Q. Do you agree with the Company's proposed net salvage rate for this account?

A. No. As with Account 376.01 discussed above, the Company-reported data demonstrates a clear trend in recent years, including net salvage rates as low as -21% and -19%.[75] The Company has cited no reason why the Commission should not expect that trend to continue going forward.

Q. What is your recommended net salvage rate for Account 376.01?

A. I recommend a net salvage rate of -40%, which is equal to the most recent five-year average net salvage rate.

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[73] *Id*. at 11-842.

[74] *Id*. at 11-841.

[75] Id. at 11-810.

C. Account 380 – Services

Q. Describe the Company's net salvage proposal for Account 380.

A. The depreciation study recommends a net salvage rate of -55%.[76] The depreciation study acknowledges that the "most recent five-year average net salvage is (40) percent," but states it is "influenced by lower cost of removal from 2012-2016."[77]

Q. Do you agree with the Company's proposed net salvage rate for this account?

A. No. By apparently ignoring the most recent five years of net salvage data, the Company is disregarding net salvage rates as low as -26%, -18%, 15% and even -5%.[78] That tactic is not appropriate, and it has resulted in an unreasonably high net salvage rate proposal by the Company.

Q. What is your recommended net salvage rate for Account 380?

A. I recommend a net salvage rate of -44%, which is equal to the most recent five-year average net salvage rate.

VII. CONCLUSION AND RECOMMENDATION

Q. Summarize the key points of your testimony.

A. PG&E is requesting a substantial increase in depreciation expense in this case, which is largely driven by its excessively high depreciation rate proposals. I found several errors and unreasonable assumptions in the depreciation study:

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[76] PG&E-10, WP 11-802

[77] *Id*.

[78] *Id*. at 11-810.

1. Several of the service lives proposed by the Company for its mass property accounts are too short given the Company's own historical data. In conducing his service life analysis in this case, Mr. Allis relied too heavily on Gannet Fleming's own version of the Company's historical data, which consistently resulted in shorter survivor curves than what were derived from the Company's real historical data. Objective Iowa curve analysis reveals that the Company's estimated service lives are unreasonably short for several accounts, which results in unreasonably high depreciation expense for ratepayers.

2. The Company provided virtually no evidence to support its service life proposal of only five years for its software accounts, which results in a proposed depreciation of more than $192 million. I present evidence showing that the average service life of these accounts should be at least 10 years, which is the service life I recommend.

3. The Commission has expressed an interest in gradualism concerning increasing negative net salvage rates imposed on customers. Pursuant to the Commission's guidelines, I propose net salvage adjustments to several of the Company's mass property accounts. For several other accounts, Mr. Allis admittedly disregarded recent and relevant net salvage data when conducting his net salvage analysis. This error resulted in net salvage rates being underestimated (i.e., more negative) than otherwise indicated by the recent historical data.

Q. What is your recommendation to the Commission?

A. I recommend the Commission adopt TURN's proposed deprecation rates, which are presented in Exhibit DJG-4.

Q. Does this conclude your testimony?

A. Yes.

APPENDIX A:

THE DEPRECIATION SYSTEM

A depreciation accounting system may be thought of as a dynamic system in which estimates of life and salvage are inputs to the system, and the accumulated depreciation account is a measure of the state of the system at any given time.[79] The primary objective of the depreciation system is the timely recovery of capital. The process for calculating the annual accruals is determined by the factors required to define the system. A depreciation system should be defined by four primary factors: 1) a method of allocation; 2) a procedure for applying the method of allocation to a group of property; 3) a technique for applying the depreciation rate; and 4) a model for analyzing the characteristics of vintage groups comprising a continuous property group.[80] The figure below illustrates the basic concept of a depreciation system and includes some of the available parameters.[81]

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

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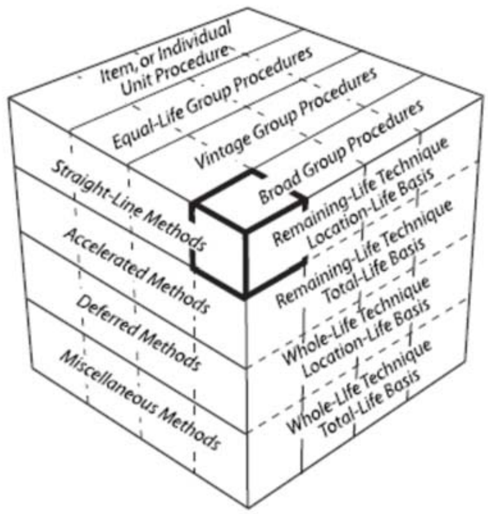
[79] Wolf *supra* n. 9, at 69-70.

[80] *Id.* at 70, 139-40.

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

Figure 17:
The Depreciation System Cube



1. <u>Allocation Methods</u>

The "method" refers to the pattern of depreciation in relation to the accounting periods. The method most commonly used in the regulatory context is the "straight-line method" – a type of age-life method in which the depreciable cost of plant is charged in equal amounts to each accounting period over the service life of plant.[82] Because group depreciation rates and plant balances often change, the amount of the annual accrual rarely remains the same, even when the straight-line method is employed.[83] The basic formula for the straight-line method is as follows:[84]

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[82] NARUC *supra* n. 10, at 56.

[83] *Id*.

[84] *Id*.

Equation 1:
Straight-Line Accrual

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

Gross plant is a known amount from the utility's records, while both net salvage and service life must be estimated to calculate the annual accrual. The straight-line method differs from accelerated methods of recovery, such as the "sum-of-the-years-digits" method and the "declining balance" method. Accelerated methods are primarily used for tax purposes and are rarely used in the regulatory context for determining annual accruals.[85] In practice, the annual accrual is expressed as a rate which is applied to the original cost of plant to determine the annual accrual in dollars. The formula for determining the straight-line rate is as follows:[86]

Equation 2:
Straight-Line Rate

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

2. Grouping Procedures

The "procedure" refers to the way the allocation method is applied through subdividing the total property into groups.[87] While single units may be analyzed for depreciation, a group plan of depreciation is particularly adaptable to utility property. Employing a grouping procedure allows for a composite application of depreciation rates to groups of similar property, rather than

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[85] *Id*. at 57.

[86] *Id*. at 56.

[87] Wolf *supra* n. 9, at 74-75.

conducting calculations for each unit. Whereas an individual unit of property has a single life, a group of property displays a dispersion of lives and the life characteristics of the group must be described statistically.[88] When analyzing mass property categories, it is important that each group contains homogenous units of plant that are used in the same general manner throughout the plant and operated under the same general conditions.[89]

The "average life" and "equal life" grouping procedures are the two most common. In the average life procedure, a constant annual accrual rate based on the average life of all property in the group is applied to the surviving property. While property having shorter lives than the group average will not be fully depreciated, and likewise, property having longer lives than the group average will be over-depreciated, the ultimate result is that the group will be fully depreciated by the time of the final retirement.[90] Thus, the average life procedure treats each unit as though its life is equal to the average life of the group. In contrast, the equal life procedure treats each unit in the group as though its life was known.[91] Under the equal life procedure the property is divided into subgroups that each has a common life.[92]

3. Application Techniques

The third factor of a depreciation system is the "technique" for applying the depreciation rate. There are two commonly used techniques: "whole life" and "remaining life." The whole life

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[88] *Id*. at 74.

[89] NARUC *supra* n. 10, at 61-62.

[90] *See* Wolf *supra* n. 9, at 74-75.

[91] *Id*. at 75.

[92] *Id*.

technique applies the depreciation rate on the estimated average service life of a group, while the remaining life technique seeks to recover undepreciated costs over the remaining life of the plant.[93]

In choosing the application technique, consideration should be given to the proper level of the accumulated depreciation account. Depreciation accrual rates are calculated using estimates of service life and salvage. Periodically these estimates must be revised due to changing conditions, which cause the accumulated depreciation account to be higher or lower than necessary. Unless some corrective action is taken, the annual accruals will not equal the original cost of the plant at the time of final retirement.[94] Analysts can calculate the level of imbalance in the accumulated depreciation account by determining the "calculated accumulated depreciation," (a.k.a. "theoretical reserve" and referred to in these appendices as "CAD"). The CAD is the calculated balance that would be in the accumulated depreciation account at a point in time using current depreciation parameters.[95] An imbalance exists when the actual accumulated depreciation account does not equal the CAD. The choice of application technique will affect how the imbalance is dealt with.

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

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[93] NARUC *supra* n. 10, at 63-64.

[94] Wolf *supra* n. 9, at 83.

[95] NARUC *supra* n. 10, at 325.

in the annual accrual.[96] This is one reason that the remaining life technique is popular among practitioners and regulators. The basic formula for the remaining life technique is as follows:[97]

Equation 3:
Remaining Life Accrual

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

The remaining life accrual formula is similar to the basic straight-line accrual formula above with two notable exceptions. First, the numerator has an additional factor in the remaining life formula: the accumulated depreciation. Second, the denominator is "average remaining life" instead of "average life." Essentially, the future accrual of plant (gross plant less accumulated depreciation) is allocated over the remaining life of plant. Thus, the adjustment to accumulated depreciation is "automatic" in the sense that it is built into the remaining life calculation.[98]

4. Analysis Model

The fourth parameter of a depreciation system, the "model," relates to the way of viewing the life and salvage characteristics of the vintage groups that have been combined to form a continuous property group for depreciation purposes.[99] A continuous property group is created when vintage groups are combined to form a common group. Over time, the characteristics of the property may change, but the continuous property group will continue. The two analysis models

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[96] NARUC *supra* n. 10, at 65 ("The desirability of using the remaining life technique is that any necessary adjustments of [accumulated depreciation] . . . are accrued automatically over the remaining life of the property. Once commenced, adjustments to the depreciation reserve, outside of those inherent in the remaining life rate would require regulatory approval.").

[97] *Id*. at 64.

[98] Wolf *supra* n. 9, at 178.

[99] *See* Wolf *supra* n. 9, at 139 (I added the term "model" to distinguish this fourth depreciation system parameter from the other three parameters).

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

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

APPENDIX B:

IOWA CURVES

Early work in the analysis of the service life of industrial property was based on models that described the life characteristics of human populations.[100] This explains why the word "mortality" is often used in the context of depreciation analysis. In fact, a group of property installed during the same accounting period is analogous to a group of humans born during the same calendar year. Each period the group will incur a certain fraction of deaths / retirements until there are no survivors. Describing this pattern of mortality is part of actuarial analysis and is regularly used by insurance companies to determine life insurance premiums. The pattern of mortality may be described by several mathematical functions, particularly the survivor curve and frequency curve. Each curve may be derived from the other so that if one curve is known, the other may be obtained. A survivor curve is a graph of the percent of units remaining in service expressed as a function of age.[101] A frequency curve is a graph of the frequency of retirements as a function of age. Several types of survivor and frequency curves are illustrated in the figures below.

1. Development

The survivor curves used by analysts today were developed over several decades from extensive analysis of utility and industrial property. In 1931, Edwin Kurtz and Robley Winfrey used extensive data from a range of 65 industrial property groups to create survivor curves representing the life characteristics of each group of property.[102] They generalized the 65 curves

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[100] Wolf *supra* n. 9, at 276.

[101] *Id*. at 23.

[102] *Id*. at 34.

into 13 survivor curve types and published their results in *Bulletin 103: Life Characteristics of Physical Property*. The 13 type curves were designed to be used as valuable aids in forecasting probable future service lives of industrial property. Over the next few years, Winfrey continued gathering additional data, particularly from public utility property, and expanded the examined property groups from 65 to 176.[103] This resulted in 5 additional survivor curve types for a total of 18 curves. In 1935, Winfrey published *Bulletin 125: Statistical Analysis of Industrial Property Retirements*. According to Winfrey, "[t]he 18 type curves are expected to represent quite well all survivor curves commonly encountered in utility and industrial practices."[104] These curves are known as the "Iowa curves" and are used extensively in depreciation analysis in order to obtain the average service lives of property groups. (Use of Iowa curves in actuarial analysis is further discussed in Appendix C.)

In 1942, Winfrey published *Bulletin 155: Depreciation of Group Properties*. In Bulletin 155, Winfrey made some slight revisions to a few of the 18 curve types, and published the equations, tables of the percent surviving, and probable life of each curve at five-percent intervals.[105] Rather than using the original formulas, analysts typically rely on the published tables containing the percentages surviving. This is because absent knowledge of the integration technique applied to each age interval, it is not possible to recreate the exact original published table values. In the 1970s, John Russo collected data from over 2,000 property accounts reflecting

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[103] *Id*.

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

[105] Robley Winfrey, Bulletin 155: Depreciation of Group Properties 121-28, Vol XLI, No. 1 (The Iowa State College Bulletin 1942); see also Wolf supra n. 9, at 305-38 (publishing the percent surviving for each Iowa curve, including "O" type curve, at one percent intervals).

observations during the period 1965 – 1975 as part of his Ph.D. dissertation at Iowa State. Russo essentially repeated Winfrey's data collection, testing, and analysis methods used to develop the original Iowa curves, except that Russo studied industrial property in service several decades after Winfrey published the original Iowa curves. Russo drew three major conclusions from his research:[106]

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

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

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

Prior to Russo's study, some had criticized the Iowa curves as being potentially obsolete because their development was rooted in the study of industrial property in existence during the early 1900s. Russo's research, however, negated this criticism by confirming that the Iowa curves represent a sufficiently wide range of life patterns, and that though technology will change over time, the underlying patterns of retirements remain constant and can be adequately described by the Iowa curves.[107]

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

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[106] *See* Wolf *supra* n. 9, at 37.

[107] *Id.*

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

2. Classification

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

The classification of the survivor curves was made according to whether the mode of the retirement frequency curves was to the left, to the right, or coincident with average service life. There are three modal "families" of curves: six left modal curves (L0, L1, L2, L3, L4, L5); five right modal curves (R1, R2, R3, R4, R5); and seven symmetrical curves (S0, S1, S2, S3, S4, S5, S6).[108] In the figure below, one curve from each family is shown: L0, S3 and R1, with average life at 100 on the x-axis. It is clear from the graphs that the modes for the L0 and R1 curves appear to the left and right of average life respectively, while the S3 mode is coincident with average life.

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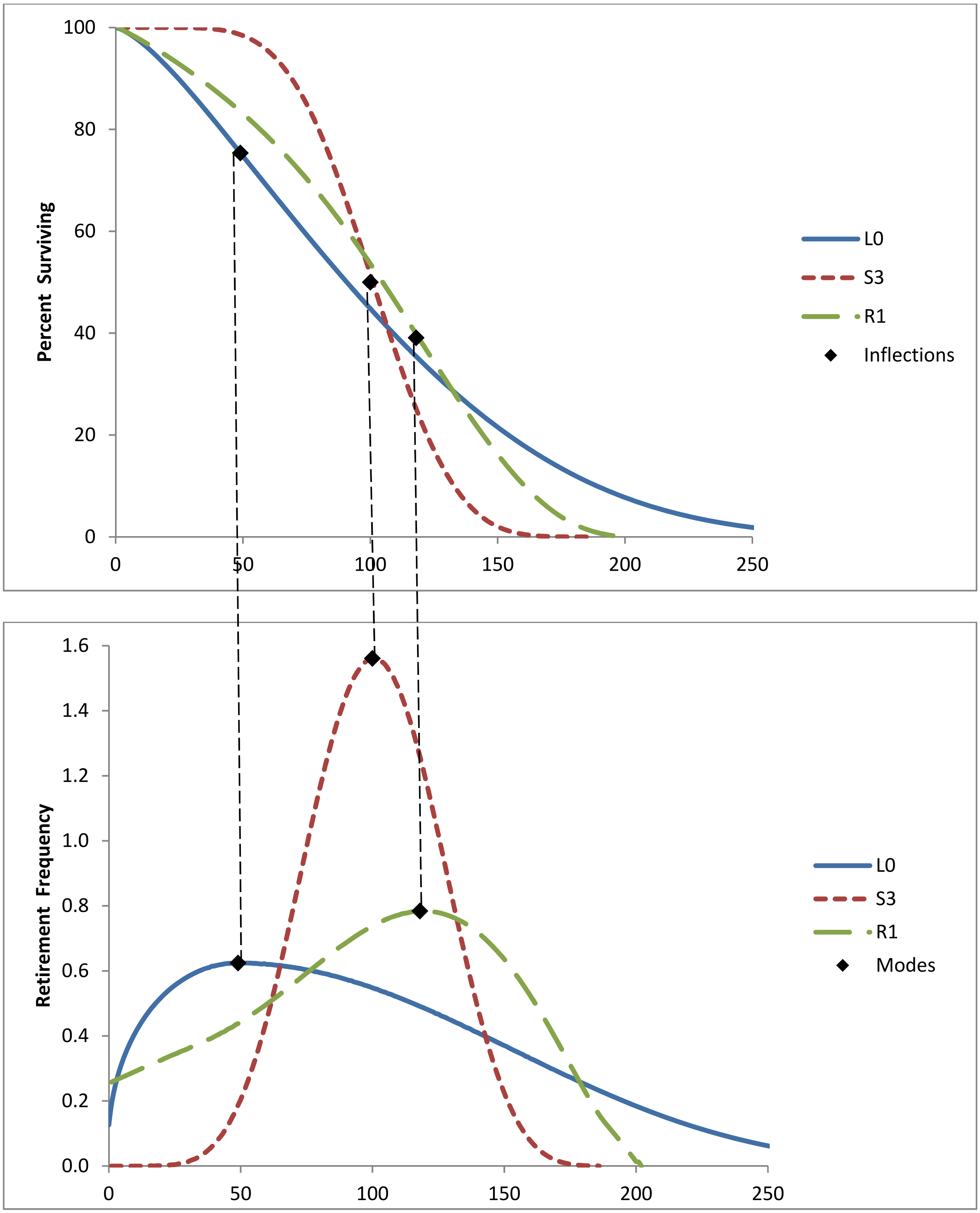
[108] In 1967, Harold A. Cowles added four origin-modal curves known as "O type" curves. There are also several "half" curves and a square curve, so the total amount of survivor curves commonly called "Iowa" curves is about 31 (see NARUC supra n. 10, at 68).

Figure 18:
Modal Age Illustration



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

> Since the location of a particular survivor on a graph is affected by both its span in years and the shape of the curve, it is difficult to classify a group of curves unless one of these variables can be controlled. This is easily done by expressing the age in percent of average life."[109]

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

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

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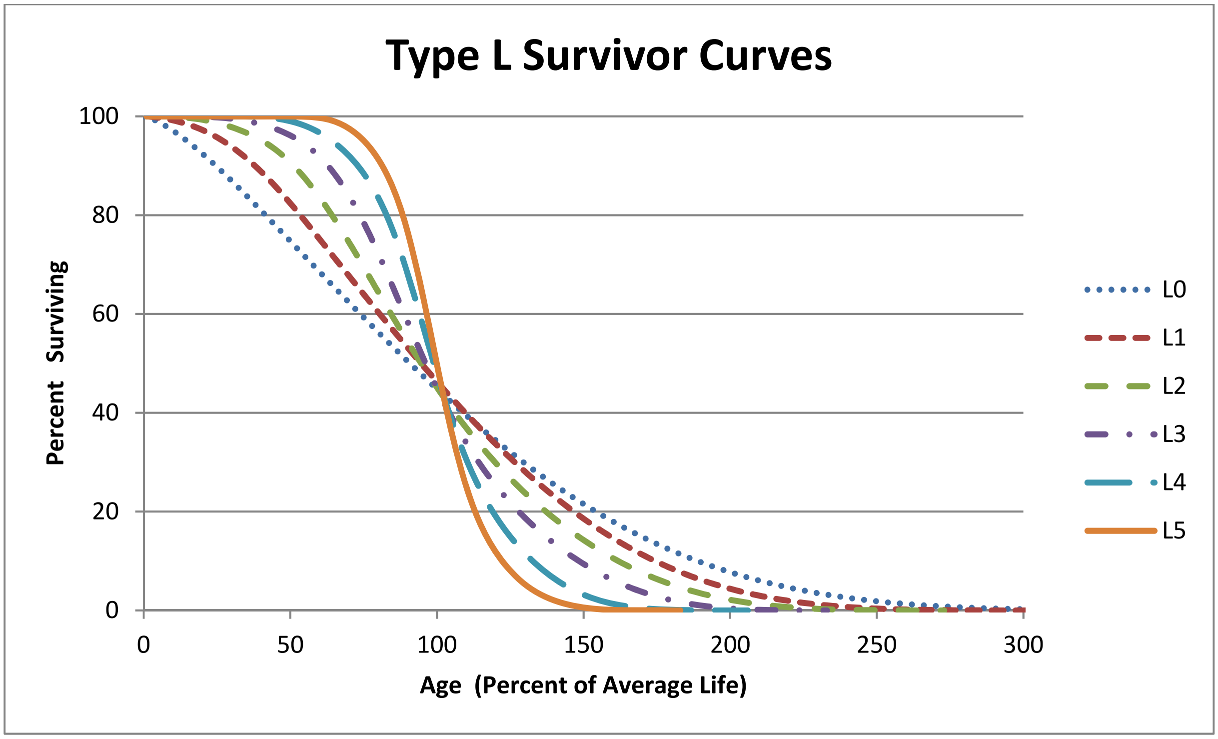
[109] Winfrey *supra* n. 75, at 60.

Figure 19:
Type L Survivor and Frequency Curves



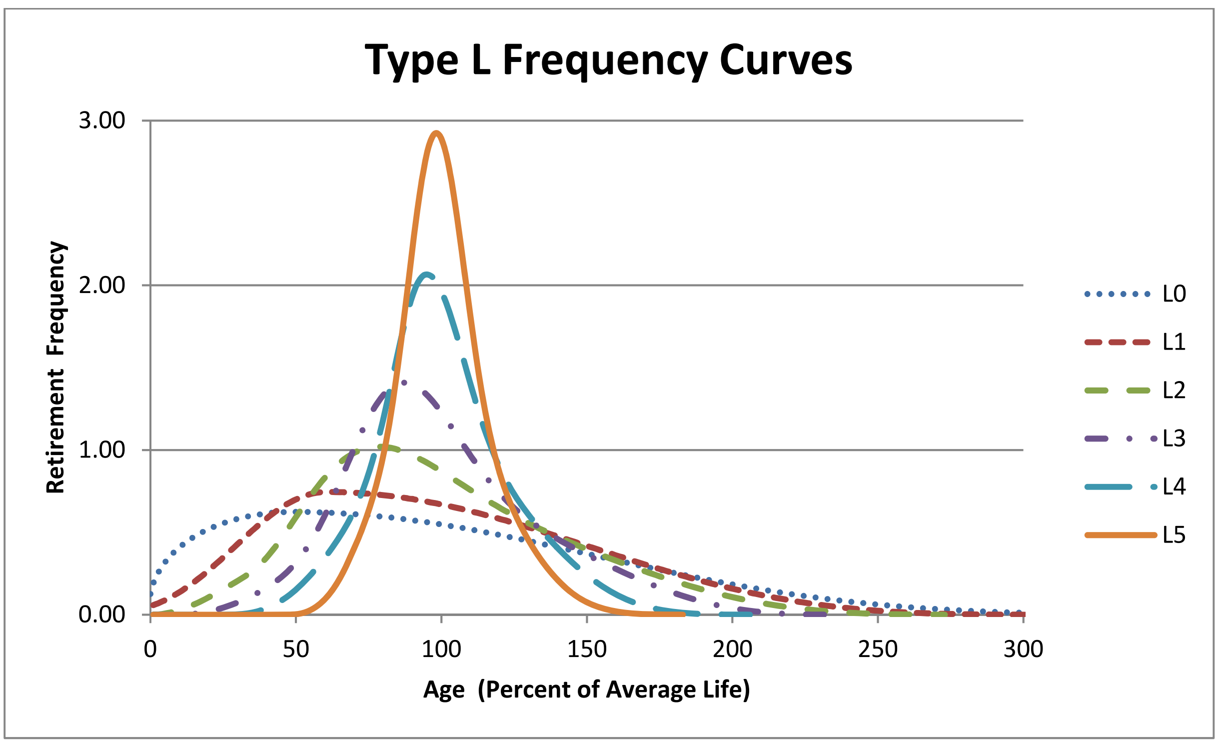
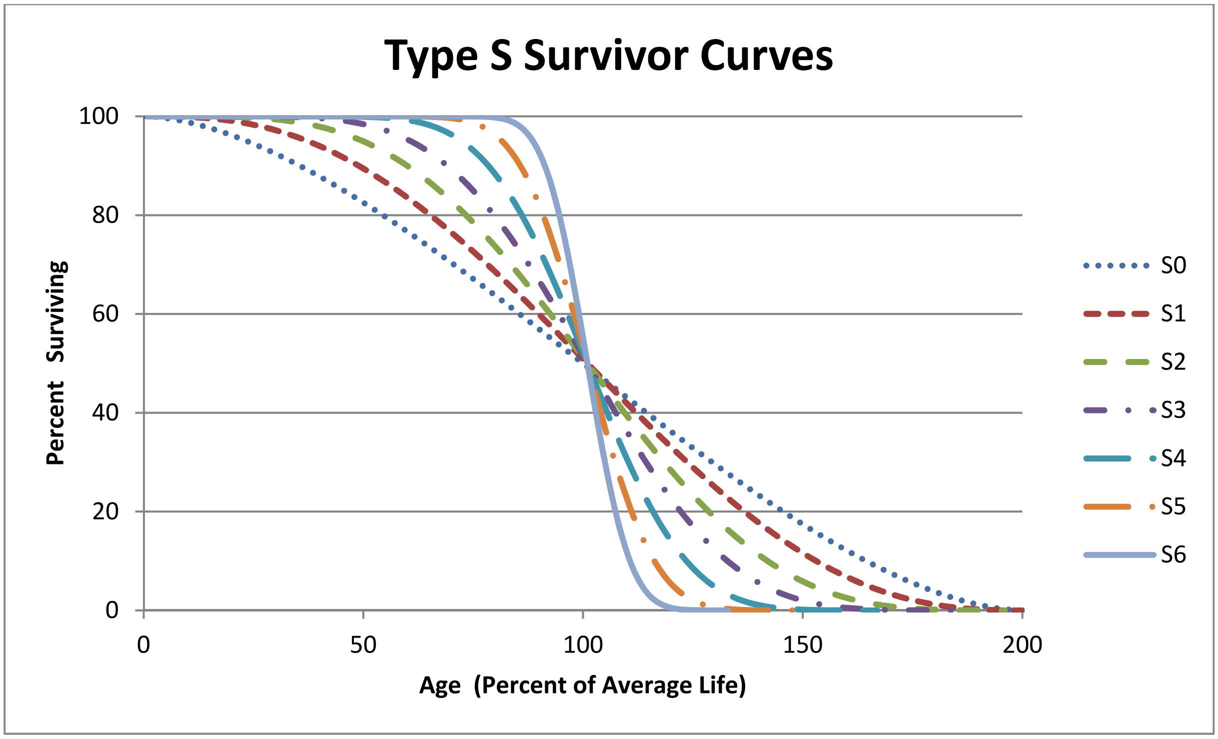


Figure 20:
Type S Survivor and Frequency Curves



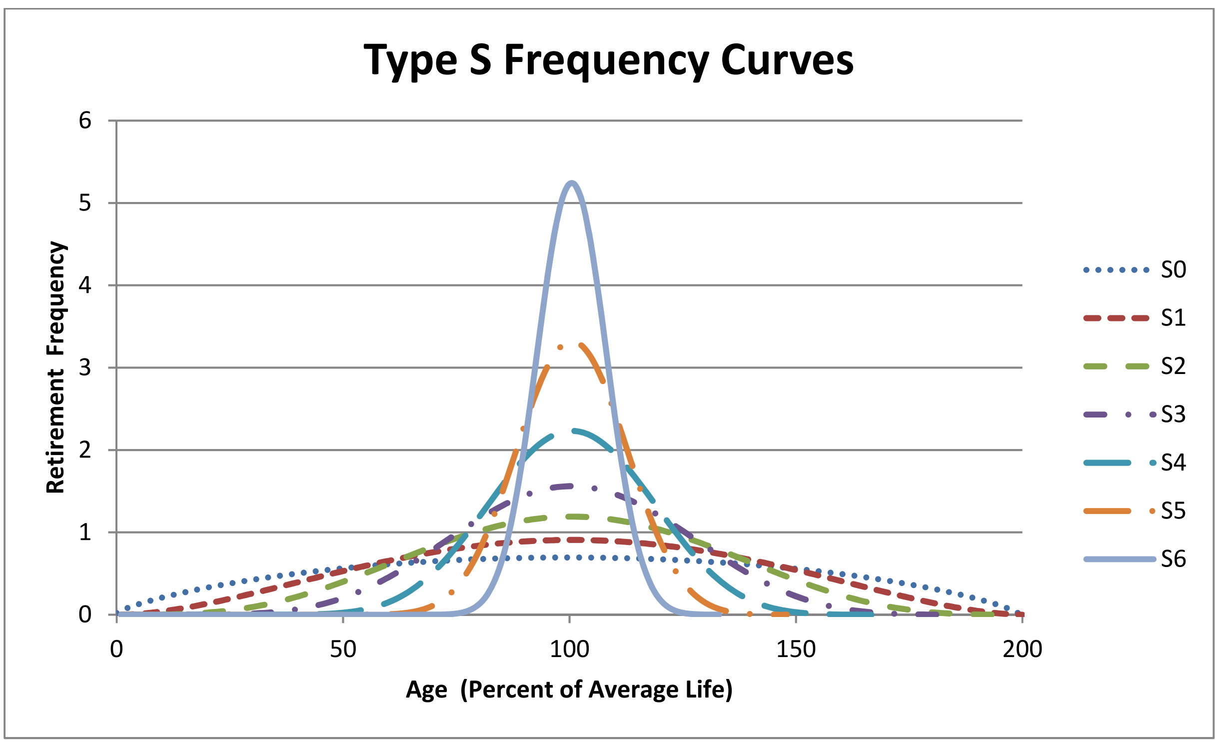
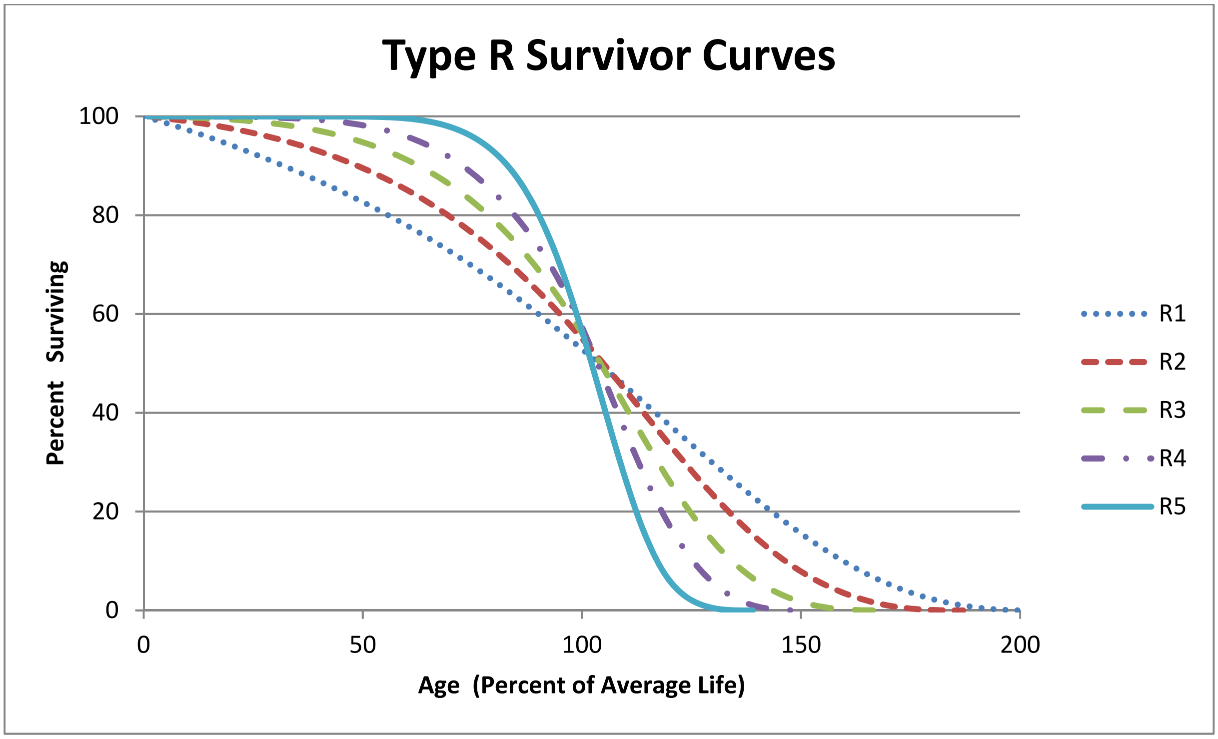
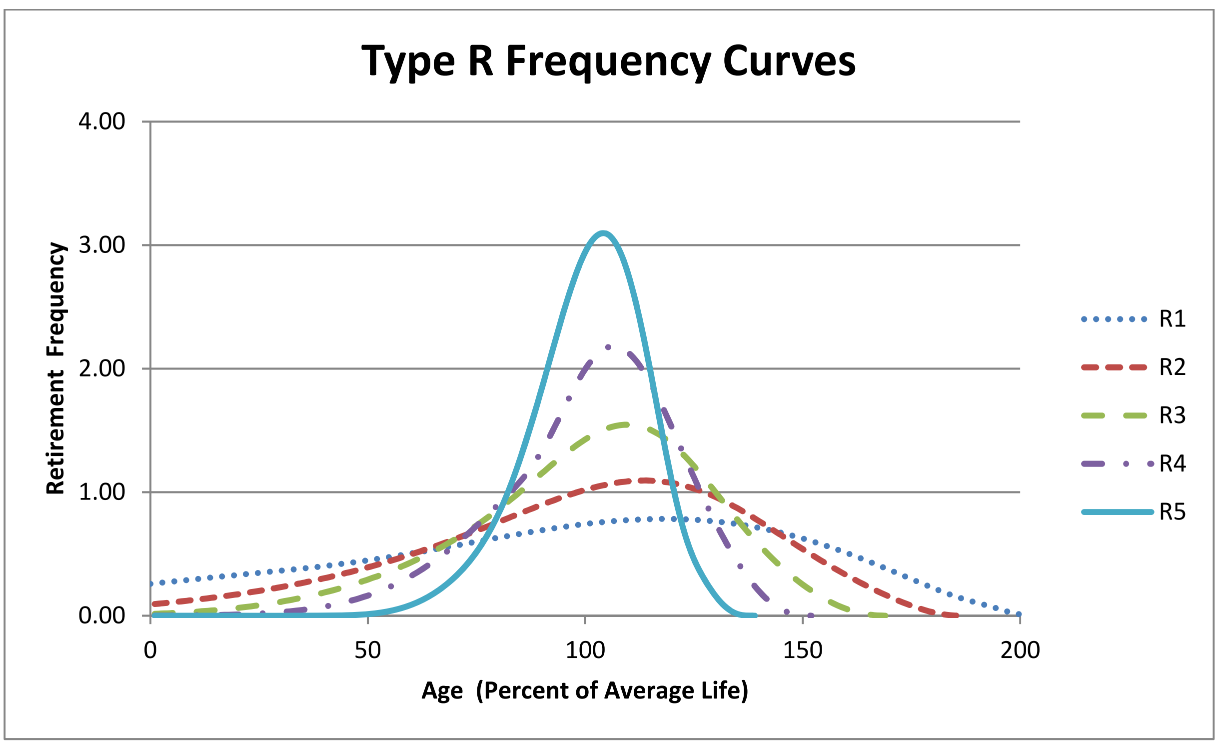


Figure 21:
Type R Survivor and Frequency Curves





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

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

Several other important statistical analyses and types of lives may be derived from an Iowa curve. These include: 1) average life; 2) realized life; 3) remaining life; and 4) probable life. The figure below illustrates these concepts. It shows the frequency curve, survivor curve, and probable life curve. Age M_x on the x-axis represents the modal age, while age AL_x represents the average age. Thus, this figure illustrates an "L type" Iowa curve since the mode occurs before the average.[110]

First, average life is the area under the survivor curve from age zero to maximum life. Because the survivor curve is measured in percent, the area under the curve must be divided by 100% to convert it from percent-years to years. The formula for average life is as follows:[111]

Equation 4:
Average Life

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

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

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

[111] *See* NARUC *supra* n. 10, at 71.

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

Realized life is similar to average life, except that realized life is the average years of service experienced to date from the vintage's original installations.[112] As shown in the figure below, realized life is the area under the survivor curve from zero to age RL_X. Likewise, unrealized life is the area under the survivor curve from age RL_X to maximum life. Thus, it could be said that average life equals realized life plus unrealized life.

Average remaining life represents the future years of service expected from the surviving property.[113] Remaining life is sometimes referred to as "average remaining life" and "life expectancy." To calculate average remaining life at age x, the area under the estimated future portion of the survivor curve is divided by the percent surviving at age x (denoted S_X). Thus, the average remaining life formula is:

Equation 5:
Average Remaining Life

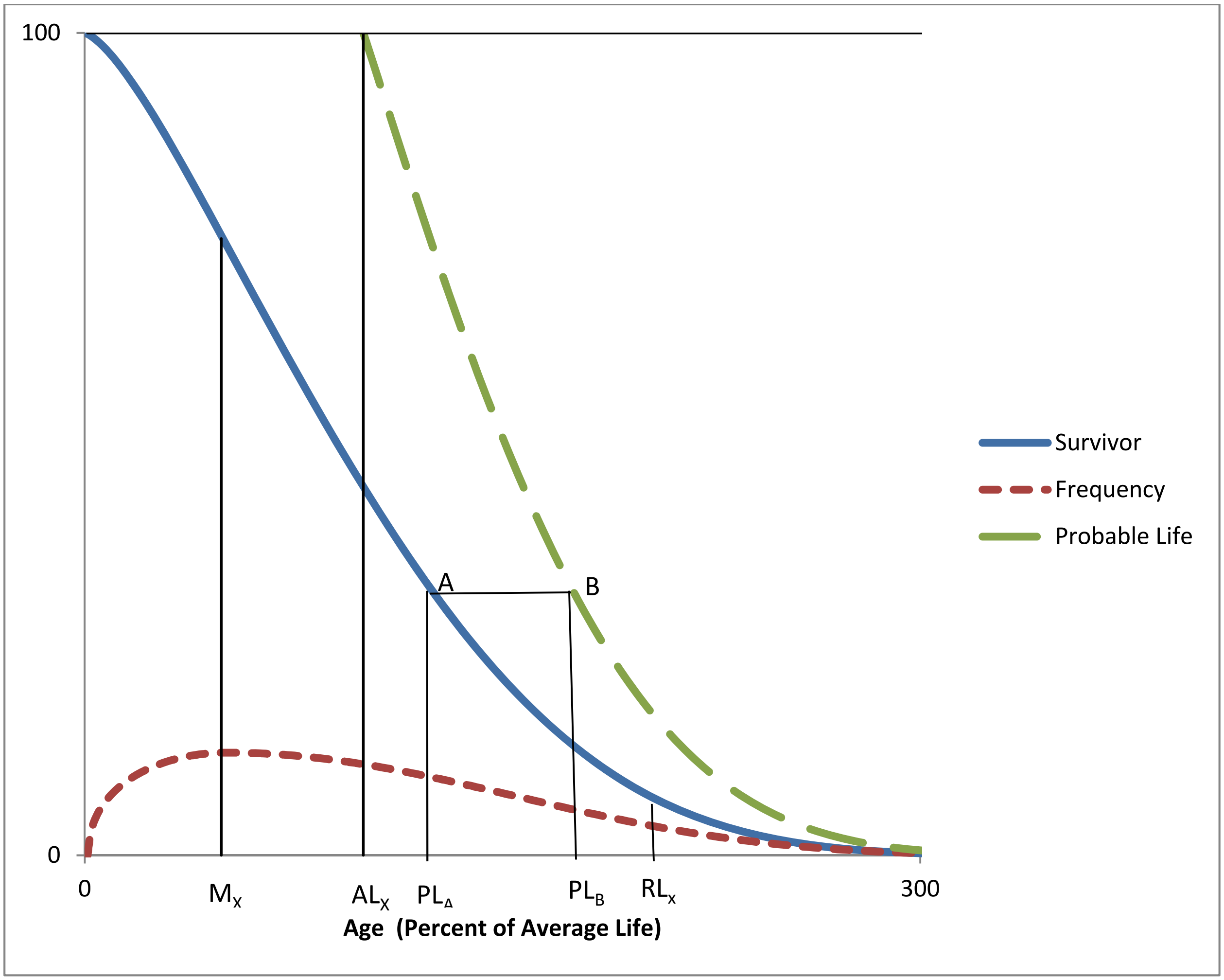
$$Average\ Remaining\ Life\ = \frac{Area\ Under\ Survivor\ Curve\ from\ Age\ x\ to\ Max\ Life}{S_X}$$

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

[112] *Id*. at 73.

[113] *Id*. at 74.

Figure 22:
Iowa Curve Derivations



Finally, the probable life may also be determined from the Iowa curve. The probable life of a property group is the total life expectancy of the property surviving at any age and is equal to the remaining life plus the current age.[114] The probable life is also illustrated in this figure. The probable life at age PL_A is the age at point PL_B. Thus, to read the probable life at age PL_A, see the

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[114] Wolf *supra* n. 9, at 28.

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

APPENDIX C:

ACTUARIAL ANALYSIS

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

The study of human mortality is analogous to estimating service lives of industrial property groups. While some humans die solely from chance, most deaths are related to age; that is, death rates generally increase as age increases. Similarly, physical plant is also subject to forces of retirement. These forces include physical, functional, and contingent factors, as shown in the table below.[115]

Figure 23:
Forces of Retirement

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

While actuaries study historical mortality data in order to predict how long a group of people will live, depreciation analysts must look at a utility's historical data in order to estimate the average lives of property groups. A utility's historical data is often contained in the Continuing Property Records ("CPR"). Generally, a CPR should contain 1) an inventory of property record

[115] NARUC *supra* n. 10, at 14-15.

units; 2) the association of costs with such units; and 3) the dates of installation and removal of plant. Since actuarial analysis includes the examination of historical data to forecast future retirements, the historical data used in the analysis should not contain events that are anomalous or unlikely to recur.[116] Historical data is used in the retirement rate actuarial method, which is discussed further below.

<u>The Retirement Rate Method</u>

There are several systematic actuarial methods that use historical data to calculate observed survivor curves for property groups. Of these methods, the retirement rate method is superior, and is widely employed by depreciation analysts.[117] The retirement rate method is ultimately used to develop an observed survivor curve, which can be fitted with an Iowa curve discussed in Appendix B to forecast average life. The observed survivor curve is calculated by using an observed life table ("OLT"). The figures below illustrate how the OLT is developed. First, historical property data are organized in a matrix format, with placement years on the left forming rows, and experience years on the top forming columns. The placement year (a.k.a. "vintage year" or "installation year") is the year of placement into service of a group of property. The experience year (a.k.a. "activity year") refers to the accounting data for a particular calendar year. The two matrices below use aged data – that is, data for which the dates of placements, retirements, transfers, and other transactions are known. Without aged data, the retirement rate actuarial method may not be employed. The first matrix is the exposure matrix, which shows the exposures

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

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

at the beginning of each year.[118] An exposure is simply the depreciable property subject to retirement during a period. The second matrix is the retirement matrix, which shows the annual retirements during each year. Each matrix covers placement years 2003–2015, and experience years 2008-2015. In the exposure matrix, the number in the 2012 experience column and the 2003 placement row is $192,000. This means at the beginning of 2012, there was $192,000 still exposed to retirement from the vintage group placed in 2003. Likewise, in the retirement matrix, $19,000 of the dollars invested in 2003 were retired during 2012.

Figure 24:
Exposure Matrix

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

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

Figure 25:
Retirement Matrix

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

These matrices help visualize how exposure and retirement data are calculated for each age interval. An age interval is typically one year. A common convention is to assume that any unit installed during the year is installed in the middle of the calendar year (i.e., July 1st). This convention is called the "half-year convention" and effectively assumes that all units are installed uniformly during the year.[119] Adoption of the half-year convention leads to age intervals of 0-0.5 years, 0.5-1.5 years, etc., as shown in the matrices.

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

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[119] Wolf *supra* n. 9, at 22.

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

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

Figure 26:
Observed Life Table

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

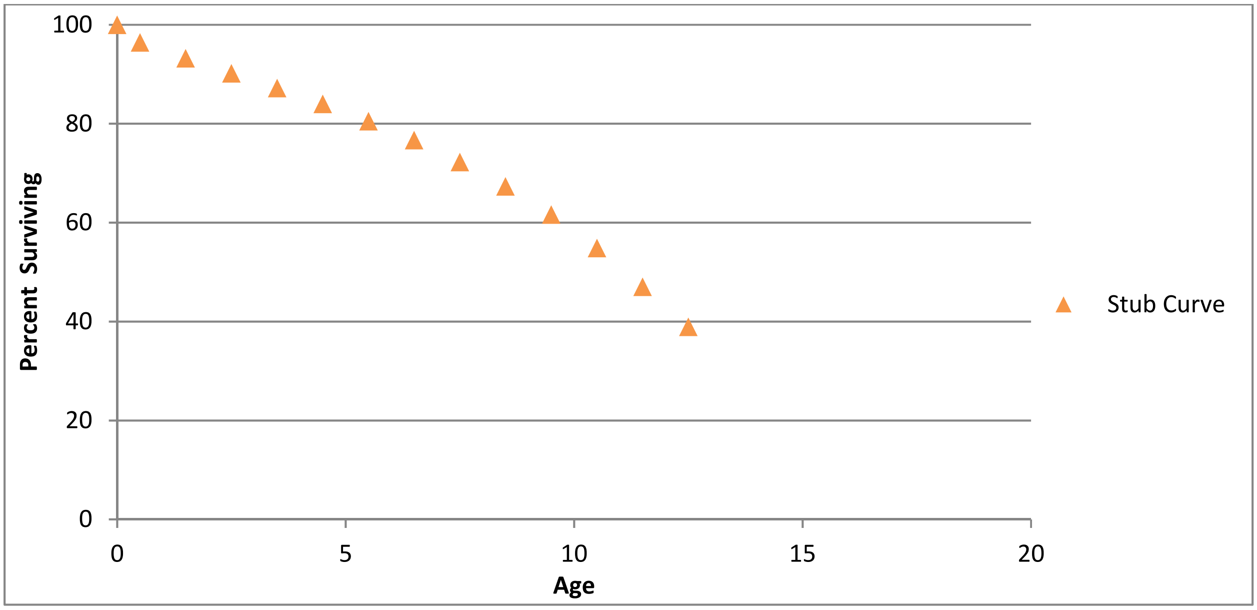
Column F on the right shows the percentages surviving at the beginning of each age interval. This column starts at 100% surviving. Each consecutive number below is calculated by multiplying the percent surviving from the previous age interval by the corresponding survivor ratio for that age interval. For example, the percent surviving at the start of age interval 1.5 is 93.21%, which was calculated by multiplying the percent surviving for age interval 0.5 (96.43%) by the survivor ratio for age interval 0.5 (0.967)[120].

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

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

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

Figure 27:
Original "Stub" Survivor Curve



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

Banding

The forces of retirement and characteristics of industrial property are constantly changing. A depreciation analyst may examine the magnitude of these changes. Analysts often use a technique called "banding" to assist with this process. Banding refers to the merging of several years of data into a single data set for further analysis, and it is a common technique associated with the retirement rate method.[121] There are three primary benefits of using bands in depreciation analysis:

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

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

3. Identify trends. By looking at successive bands, the analyst may identify broad trends in the data that may be useful in projecting the future life characteristics of the property.[122]

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

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[121] NARUC *supra* n. 10, at 113.

[122] *Id*.

Figure 28:
Placement Bands

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

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

Analysts often use placement bands for comparing the survivor characteristics of properties with different physical characteristics.[123] Placement bands allow analysts to isolate the effects of changes in technology and materials that occur in successive generations of plant. For example, if in 2005 an electric utility began placing transmission poles into service with a special chemical treatment that extended the service lives of those poles, an analyst could use placement bands to isolate and analyze the effect of that change in the property group's physical characteristics. While

[123] Wolf *supra* n. 9, at 182.

placement bands are very useful in depreciation analysis, they also possess an intrinsic dilemma. A fundamental characteristic of placement bands is that they yield fairly complete survivor curves for older vintages. However, with newer vintages, which are arguably more valuable for forecasting, placement bands yield shorter survivor curves. Longer "stub" curves are considered more valuable for forecasting average life. Thus, an analyst must select a band width broad enough to provide confidence in the reliability of the resulting curve fit yet narrow enough so that an emerging trend may be observed.[124]

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

[124] NARUC *supra* n. 10, at 114.

Figure 29:
Experience Bands

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

The shaded cells within the experience band equal the total exposures at the beginning of age interval 4.5–5.5 ($1,237). The same experience band would be used for the retirement matrix covering the same experience years of 2011 – 2013. This of course would result in a different OLT and original stub survivor than if the band had not been used. Analysts often use experience bands to isolate and analyze the effects of an operating environment over time.[125] Likewise, the use of experience bands allows analysis of the effects of an unusual environmental event. For example, if an unusually severe ice storm occurred in 2013, destruction from that storm would affect an electric utility's line transformers of all ages. That is, each of the line transformers from each placement year would be affected, including those recently installed in 2012, as well as those installed in 2003. Using experience bands, an analyst could isolate or even eliminate the 2013 experience year from the analysis. In contrast, a placement band would not effectively isolate the

[125] *Id.*

ice storm's effect on life characteristics. Rather, the placement band would show an unusually large rate of retirement during 2013, making it more difficult to accurately fit the data with a smooth Iowa curve. Experience bands tend to yield the most complete stub curves for recent bands because they have the greatest number of vintages included. Longer stub curves are better for forecasting. The experience bands, however, may also result in more erratic retirement dispersion making the curve fitting process more difficult.

Depreciation analysts must use professional judgment in determining the types of bands to use and the band widths. In practice, analysts may use various combinations of placement and experience bands in order to increase the data sample size, identify trends and changes in life characteristics, and isolate unusual events. Regardless of which bands are used, observed survivor curves in depreciation analysis rarely reach zero percent. This is because, as seen in the OLT above, relatively newer vintage groups have not yet been fully retired at the time the property is studied. An analyst could confine the analysis to older, fully retired vintage groups to get complete survivor curves, but such analysis would ignore some of the property currently in service and would arguably not provide an accurate description of life characteristics for current plant in service. Because a complete curve is necessary to calculate the average life of the property group, however, curve fitting techniques using Iowa curves or other standardized curves may be employed in order to complete the stub curve.

Curve Fitting

Depreciation analysts typically use the survivor curve rather than the frequency curve to fit the observed stub curves. The most commonly used generalized survivor curves in the curve fitting process are the Iowa curves discussed above. As Wolf notes, if "the Iowa curves are adopted as a model, an underlying assumption is that the process describing the retirement pattern is one of the 22 [or more] processes described by the Iowa curves."[126]

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

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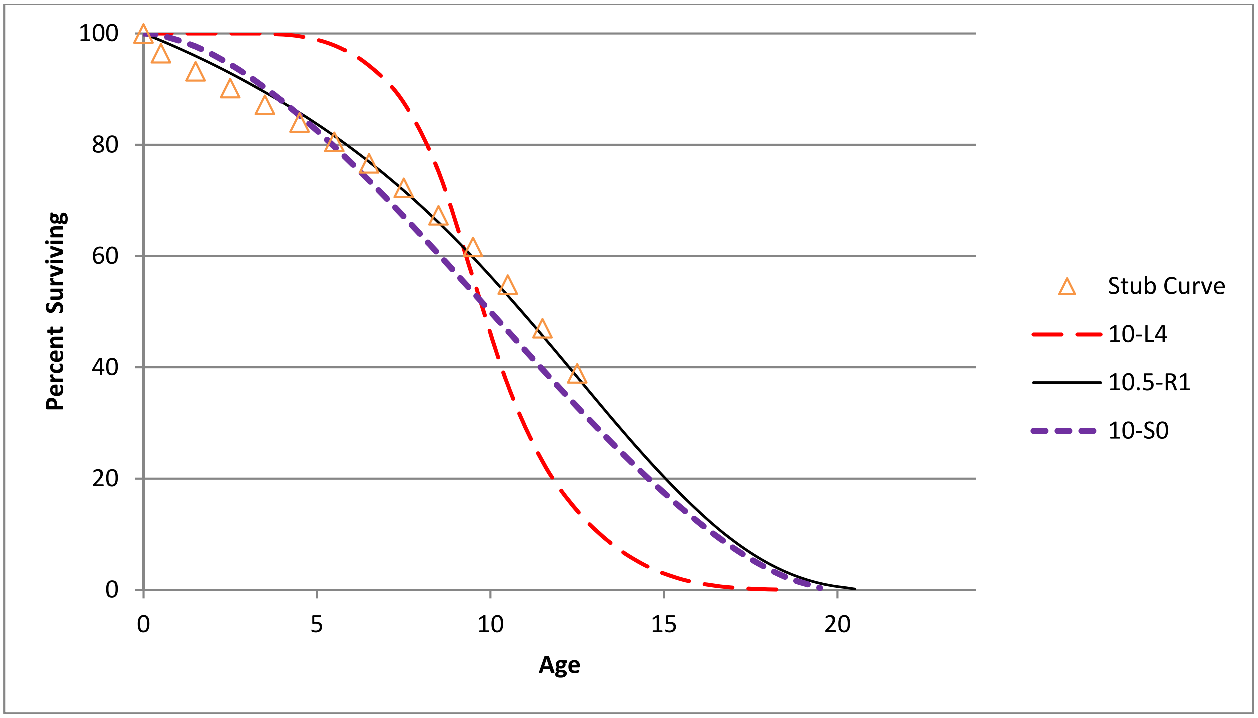
[126] Wolf *supra* n. 9, at 46 (22 curves includes Winfrey's 18 original curves plus Cowles's four "O" type curves).

Figure 30:
Visual Curve Fitting



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

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

> repeated for the remaining 21 Iowa type curves. The "best fit" is declared to be the type of curve that minimizes the sum of differences squared.[127]

Mathematical fitting requires less judgment from the analyst and is thus less subjective. Blind reliance on mathematical fitting, however, may lead to poor estimates. Thus, analysts should employ both mathematical and visual curve fitting in reaching their final estimates. This way, analysts may utilize the objective nature of mathematical fitting while still employing professional judgment. As Wolf notes: "The results of mathematical curve fitting serve as a guide for the analyst and speed the visual fitting process. But the results of the mathematical fitting should be checked visually, and the final determination of the best fit be made by the analyst."[128]

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

---

[127] Wolf *supra* n. 9, at 47.

[128] *Id*. at 48.

Figure 31:
Mathematical Fitting

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

CPUC Docket: A.18-12-009
Exhibit Number: TURN-7-Atch1
Witness: David J. Garrett

PREPARED TESTIMONY OF
DAVID J. GARRETT

ADDRESSING THE PROPOSALS OF
PACIFIC GAS AND ELECTRIC COMPANY
IN ITS TEST YEAR 2020 GENERAL RATE CASE
RELATED TO DEPRECIATION RATES

ATTACHMENTS

Submitted on Behalf of

THE UTILITY REFORM NETWORK

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EDUCATION

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

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

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

PROFESSIONAL DESIGNATIONS

Society of Depreciation Professionals
Certified Depreciation Professional (CDP)

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

The Mediation Institute
Certified Civil / Commercial & Employment Mediator

WORK EXPERIENCE

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

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

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

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

TEACHING EXPERIENCE

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

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

PUBLICATIONS

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

VOLUNTEER EXPERIENCE

Calm Waters — Oklahoma City, OK
Board Member — 2015 – 2018
Participate in management of operations, attend meetings, review performance, compensation, and financial records. Assist in fundraising events.

Group Facilitator & Fundraiser — 2014 – 2018
Facilitate group meetings designed to help children and families cope with divorce and tragic events. Assist in fundraising events.

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

PROFESSIONAL ASSOCIATIONS

Oklahoma Bar Association 2007 – Present

Society of Depreciation Professionals 2014 – Present
Board Member – President 2017
Participate in management of operations, attend meetings, review performance, organize presentation agenda.

Society of Utility Regulatory Financial Analysts 2014 – Present

SELECTED CONTINUING PROFESSIONAL EDUCATION

Society of Depreciation Professionals — Austin, TX
"Life and Net Salvage Analysis" — 2015
Extensive instruction on utility depreciation, including actuarial and simulation life analysis modes, gross salvage, cost of removal, life cycle analysis, and technology forecasting.

Society of Depreciation Professionals — New Orleans, LA
"Introduction to Depreciation" and "Extended Training" — 2014
Extensive instruction on utility depreciation, including average lives and net salvage.

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

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

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

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

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

Utility Regulatory Proceedings

Regulatory Agency	Utility Applicant	Docket Number	Issues Addressed	Parties Represented
Public Utility Commission of Texas	CenterPoint Energy Houston Electric	PUC 49421	Depreciation rates, service lives, net salvage	Texas Coast Utilities Coalition
Massachusetts Department of Public Utilities	Massachusetts Electric Company and Nantucket Electric Company	D.P.U. 18-150	Depreciation rates, service lives, net salvage	Massachusetts Office of the Attorney General, Office of Ratepayer Advocacy
Oklahoma Corporation Commission	Oklahoma Gas & Electric Company	PUD 201800140	Cost of capital, authorized ROE, depreciation rates	Oklahoma Industrial Energy Consumers and Oklahoma Energy Results
Public Service Commission of the State of Montana	Montana-Dakota Utilities Company	D2018.9.60	Depreciation rates, service lives, net salvage	Montana Consumer Counsel and Denbury Onshore
Indiana Utility Regulatory Commission	Northern Indiana Public Service Company	45159	Depreciation rates, grouping procedure, demolition costs	Indiana Office of Utility Consumer Counselor
Public Service Commission of the State of Montana	NorthWestern Energy	D2018.2.12	Depreciation rates, service lives, net salvage	Montana Consumer Counsel
Oklahoma Corporation Commission	Public Service Company of Oklahoma	PUD 201800097	Depreciation rates, service lives, net salvage	Oklahoma Industrial Energy Consumers and Wal-Mart
Nevada Public Utilities Commission	Southwest Gas Corporation	18-05031	Depreciation rates, service lives, net salvage	Nevada Bureau of Consumer Protection
Public Utility Commission of Texas	Texas-New Mexico Power Company	PUC 48401	Depreciation rates, service lives, net salvage	Alliance of Texas-New Mexico Power Municipalities
Oklahoma Corporation Commission	Oklahoma Gas & Electric Company	PUD 201700496	Depreciation rates, service lives, net salvage	Oklahoma Industrial Energy Consumers and Oklahoma Energy Results
Maryland Public Service Commission	Washington Gas Light Company	9481	Depreciation rates, service lives, net salvage	Maryland Office of People's Counsel
Indiana Utility Regulatory Commission	Citizens Energy Group	45039	Depreciation rates, service lives, net salvage	Indiana Office of Utility Consumer Counselor
Public Utility Commission of Texas	Entergy Texas, Inc.	PUC 48371	Depreciation rates, decommissioning costs	Texas Municipal Group
Washington Utilities & Transportation Commission	Avista Corporation	UE-180167	Depreciation rates, service lives, net salvage	Washington Office of Attorney General
New Mexico Public Regulation Commission	Southwestern Public Service Company	17-00255-UT	Cost of capital and authorized rate of return	HollyFrontier Navajo Refining; Occidental Permian
Public Utility Commission of Texas	Southwestern Public Service Company	PUC 47527	Depreciation rates, plant service lives	Alliance of Xcel Municipalities
Public Service Commission of the State of Montana	Montana-Dakota Utilities Company	D2017.9.79	Depreciation rates, service lives, net salvage	Montana Consumer Counsel

Utility Regulatory Proceedings

Regulatory Agency	Utility Applicant	Docket Number	Issues Addressed	Parties Represented
Florida Public Service Commission	Florida City Gas	20170179-GU	Cost of capital, depreciation rates	Florida Office of Public Counsel
Washington Utilities & Transportation Commission	Avista Corporation	UE-170485	Cost of capital and authorized rate of return	Washington Office of Attorney General
Wyoming Public Service Commission	Powder River Energy Corporation	10014-182-CA-17	Credit analysis, cost of capital	Private customer
Oklahoma Corporation Commission	Public Service Co. of Oklahoma	PUD 201700151	Depreciation, terminal salvage, risk analysis	Oklahoma Industrial Energy Consumers
Public Utility Commission of Texas	Oncor Electric Delivery Company	PUC 46957	Depreciation rates, simulated analysis	Alliance of Oncor Cities
Nevada Public Utilities Commission	Nevada Power Company	17-06004	Depreciation rates, service lives, net salvage	Nevada Bureau of Consumer Protection
Public Utility Commission of Texas	El Paso Electric Company	PUC 46831	Depreciation rates, interim retirements	City of El Paso
Idaho Public Utilities Commission	Idaho Power Company	IPC-E-16-24	Accelerated depreciation of North Valmy plant	Micron Technology, Inc.
Idaho Public Utilities Commission	Idaho Power Company	IPC-E-16-23	Depreciation rates, service lives, net salvage	Micron Technology, Inc.
Public Utility Commission of Texas	Southwestern Electric Power Company	PUC 46449	Depreciation rates, decommissioning costs	Cities Advocating Reasonable Deregulation
Massachusetts Department of Public Utilities	Eversource Energy	D.P.U. 17-05	Cost of capital, capital structure, and rate of return	Sunrun Inc.; Energy Freedom Coalition of America
Railroad Commission of Texas	Atmos Pipeline - Texas	GUD 10580	Depreciation rates, grouping procedure	City of Dallas
Public Utility Commission of Texas	Sharyland Utility Company	PUC 45414	Depreciation rates, simulated analysis	City of Mission
Oklahoma Corporation Commission	Empire District Electric Company	PUD 201600468	Cost of capital, depreciation rates	Oklahoma Industrial Energy Consumers
Railroad Commission of Texas	CenterPoint Energy Texas Gas	GUD 10567	Depreciation rates, simulated plant analysis	Texas Coast Utilities Coalition
Arkansas Public Service Commission	Oklahoma Gas & Electric Company	160-159-GU	Cost of capital, depreciation rates, terminal salvage	Arkansas River Valley Energy Consumers; Wal-Mart
Florida Public Service Commission	Peoples Gas	160-159-GU	Depreciation rates, service lives, net salvage	Florida Office of Public Counsel

Utility Regulatory Proceedings

Regulatory Agency	Utility Applicant	Docket Number	Issues Addressed	Parties Represented
Arizona Corporation Commission	Arizona Public Service Company	E-01345A-16-0036	Cost of capital, depreciation rates, terminal salvage	Energy Freedom Coalition of America
Nevada Public Utilities Commission	Sierra Pacific Power Company	16-06008	Depreciation rates, net salvage, theoretical reserve	Northern Nevada Utility Customers
Oklahoma Corporation Commission	Oklahoma Gas & Electric Co.	PUD 201500273	Cost of capital, depreciation rates, terminal salvage	Public Utility Division
Oklahoma Corporation Commission	Public Service Co. of Oklahoma	PUD 201500208	Cost of capital, depreciation rates, terminal salvage	Public Utility Division
Oklahoma Corporation Commission	Oklahoma Natural Gas Company	PUD 201500213	Cost of capital, depreciation rates, net salvage	Public Utility Division

Summary Accrual Adjustment

Exhibit DJG-2

Division / Function	Plant 12/31/2017	PG&E Proposal Rate	PG&E Proposal Accrual	TURN Proposal Rate	TURN Proposal Accrual	TURN Adjustment Rate	TURN Adjustment Adjustment
Electric Division							
Intangible	$ 118,062,168	2.86%	$ 3,374,140	2.52%	$ 2,971,391	-0.34%	$ (402,748)
Production	5,935,225,737	3.29%	195,124,165	3.29%	195,124,165	0.00%	(0)
Transmission	410,076,700	2.67%	10,937,814	2.25%	9,233,636	-0.42%	(1,704,178)
Distribution	28,413,750,969	4.24%	1,204,301,802	3.56%	1,011,387,443	-0.68%	(192,914,359)
General	470,111,106	5.85%	27,479,454	5.85%	27,479,454	0.00%	(0)
Total Electric Division	$ 35,347,226,681	4.08%	$ 1,441,217,375	3.53%	$ 1,246,196,089	-0.55%	$ (195,021,286)
Gas Division							
Intangible	$ 13,610,858	47.40%	$ 6,451,672	8.90%	$ 1,211,521	-38.50%	$ (5,240,151)
Production	507,239	1.75%	8,900	1.75%	8,900	0.00%	0
Local Storage	16,347,040	2.53%	413,338	2.53%	413,338	0.00%	(0)
Distribution	10,141,235,114	3.20%	324,931,547	2.41%	244,369,398	-0.79%	(80,562,149)
General	312,563,139	4.35%	13,604,486	4.35%	13,604,486	0.00%	0
Total Gas Division	$ 10,484,263,390	3.29%	$ 345,409,944	2.48%	$ 259,607,644	-0.82%	$ (85,802,299)
Common Division	$ 6,243,975,518	8.92%	$ 557,067,760	6.90%	$ 431,014,355	-2.02%	$ (126,053,404)
Total Plant Studied	$ 52,075,465,588	4.50%	$ 2,343,695,078	3.72%	$ 1,936,818,089	-0.78%	**$ (406,876,989)**

Depreciation Parameter Comparison

Account No.	Description	Current Parameters Net Salvage	Current Iowa Curve Type	Current AL	PG&E Proposal Net Salvage	PG&E Iowa Curve Type	PG&E AL	TURN Proposal Net Salvage	TURN Iowa Curve Type	TURN AL
	ELECTRIC PLANT									
303.03	COMPUTER SOFTWARE	0%	SQ	5	0%	SQ	5	0%	SQ	10
353.02	STATION EQUIPMENT - SUT	-5%	R1.5	55	-5%	R1.5	55	-5%	R1.5	61
353.03	STATION EQUIPMENT - SUT CC	-5%	R1.5	55	-5%	R1.5	55	-5%	R1.5	61
355.00	POLES AND FIXTURES	-80%	R1.5	52	-80%	R1.5	52	-80%	R1.5	58
362.00	STATION EQUIPMENT	-40%	R1.5	46	-60%	R1.5	46	-45%	R1.5	52
364.00	POLES, TOWERS AND FIXTURES	-150%	R1.5	44	-175%	R1.5	44	-156%	R2	51
365.00	OH CONDUCTORS AND DEVICES	-125%	R2	46	-100%	R2	46	-86%	R2	52
366.00	UG CONDUIT	-50%	R4	62	-50%	R4	62	-50%	R4	70
367.00	UG CONDUCTORS AND DEVICES	-65%	R3	47	-80%	R3	47	-80%	R3	54
368.01	LINE TRANSFORMERS - OH	-30%	R2.5	32	-40%	R2.5	32	-33%	R2.5	34
369.01	SERVICES - OVERHEAD	-125%	R2.5	52	-125%	R2.5	52	-125%	R2.5	59
369.02	SERVICES - UNDERGROUND	-45%	R4	45	-45%	R4	45	-45%	R4	53
370.01	METERS	-15%	R1.5	20	-20%	R2	20	-20%	R2	20
	GAS PLANT									
303.02	SOFTWARE	0%	SQ	5	0%	SQ	5	0%	SQ	10
376.01	MAINS	-55%	R3	57	-55%	R3	57	-40%	R3	57
378.00	M&R STATION EQUIPMENT	-35%	R2	55	-40%	R2	55	-40%	R2	59
380.00	SERVICES	-124%	R3	57	-100%	R3	57	-44%	R3	60
381.00	METERS	-50%	S1	28	-50%	S1	28	-50%	S1	30
383.00	HOUSE REGULATORS	-10%	R2	28	-15%	R2	28	-15%	R2	28
	COMMON PLANT									
303.02	SOFTWARE	0%	SQ	5	0%	SQ	5	0%	SQ	10

Detailed Rate Comparison

		[1]	[2]		[3]		[4]	
			PG&E Proposal		TURN Proposal		TURN Adjustment	
Account No.	Description	Plant 12/31/2017	Rate	Annual Accrual	Rate	Annual Accrual	Rate	Annual Accrual
	ELECTRIC DIVISION							
	Intangible Plant							
302.01	FRANCHISES AND CONSENTS	113,935,938	2.40%	2,735,536	2.40%	2,735,536	0.00%	0
303.01	USBR - LIMITED TERM ELECTRIC	999,605	0.00%	0	0.00%	0	0.00%	0
303.03	COMPUTER SOFTWARE	3,126,625	20.42%	638,603	7.54%	235,855	-12.88%	-402,748
	TOTAL INTANGIBLE PLANT	118,062,168	2.86%	3,374,140	2.52%	2,971,391	-0.34%	-402,748
	Steam Production Plant							
310.02	LAND RIGHTS	4,801,315	4.27%	205,027	4.27%	205,027	0.00%	0
311.03	STRUCTURES AND IMPROVEMENTS	111,035,153	3.43%	3,804,726	3.43%	3,804,726	0.00%	0
312.03	BOILER PLANT EQUIPMENT	271,890,028	3.62%	9,848,511	3.62%	9,848,511	0.00%	0
312.05	BOILER PLANT EQUIPMENT - POLLUTION CONTROL	1,473,122	3.48%	51,333	3.48%	51,333	0.00%	0
314.03	TURBOGENERATOR UNITS	240,186,384	3.55%	8,515,397	3.55%	8,515,397	0.00%	0
315.03	ACCESSORY ELECTRIC EQUIPMENT	51,649,878	3.59%	1,853,818	3.59%	1,853,818	0.00%	0
316.03	MISCELLANEOUS POWER PLANT EQUIPMENT	25,616,853	3.70%	947,307	3.70%	947,307	0.00%	0
	TOTAL STEAM PRODUCTION PLANT	706,652,732	3.57%	25,226,119	3.57%	25,226,119	0.00%	0
	Hydro Production Plant							
	HYDRO PRODUCTION							
330.04	LAND RIGHTS	15,021,265	4.65%	697,841	4.65%	697,841	0.00%	0
330.05	LAND RIGHTS - FISH AND WILDLIFE	5,973	7.47%	446	7.47%	446	0.00%	0
330.06	LAND RIGHTS - RECREATION	2,283,503	10.32%	235,559	10.32%	235,559	0.00%	0
331.00	STRUCTURES AND IMPROVEMENTS	325,023,328	3.61%	11,725,217	3.61%	11,725,217	0.00%	0
332.00	RESERVOIRS, DAMS AND WATERWAYS	1,655,699,718	2.21%	36,623,579	2.21%	36,623,579	0.00%	0
333.00	WATERWHEELS, TURBINES AND GENERATORS	732,172,381	4.12%	30,135,329	4.12%	30,135,329	0.00%	0
334.00	ACCESSORY ELECTRIC EQUIPMENT	214,917,509	3.35%	7,198,608	3.35%	7,198,608	0.00%	0
335.00	MISCELLANEOUS POWER PLANT EQUIPMENT	76,959,518	4.27%	3,284,993	4.27%	3,284,993	0.00%	0
336.00	ROADS, RAILROADS AND BRIDGES	76,283,921	3.30%	2,519,361	3.30%	2,519,361	0.00%	0
	TOTAL HYDRO PRODUCTION	3,098,367,117	2.98%	92,420,933	2.98%	92,420,933	0.00%	0
	HELMS PUMPED STORAGE							
330.04	LAND RIGHTS	348	10.90%	38	10.89%	38	-0.01%	0
331.00	STRUCTURES AND IMPROVEMENTS	174,350,546	1.46%	2,547,253	1.46%	2,547,253	0.00%	0

Detailed Rate Comparison

		[1]	[2]		[3]		[4]	
			PG&E Proposal		TURN Proposal		TURN Adjustment	
Account No.	Description	Plant 12/31/2017	Rate	Annual Accrual	Rate	Annual Accrual	Rate	Annual Accrual
332.00	RESERVOIRS, DAMS AND WATERWAYS	428,057,493	0.80%	3,428,464	0.80%	3,428,464	0.00%	0
333.00	WATERWHEELS, TURBINES AND GENERATORS	240,394,729	6.61%	15,886,300	6.61%	15,886,300	0.00%	0
334.00	ACCESSORY ELECTRIC EQUIPMENT	56,131,783	2.83%	1,587,687	2.83%	1,587,687	0.00%	0
335.00	MISCELLANEOUS POWER PLANT EQUIPMENT	20,398,178	4.49%	915,724	4.49%	915,724	0.00%	0
336.00	ROADS, RAILROADS AND BRIDGES	8,723,723	0.56%	49,266	0.56%	49,266	0.00%	0
	TOTAL HELMS PUMPED STORAGE	928,056,800	2.63%	24,414,733	2.63%	24,414,733	0.00%	0
	TOTAL HYDRO PRODUCTION PLANT	4,026,423,917	2.90%	116,835,666	2.90%	116,835,666	0.00%	0
	Other Production Plant							
	OTHER PRODUCTION							
340.02	LAND RIGHTS	3,120,988	4.27%	133,214	4.27%	133,214	0.00%	0
341.01	STRUCTURES AND IMPROVEMENTS	141,831,567	3.49%	4,943,640	3.49%	4,943,640	0.00%	0
342.01	FUEL HOLDERS, PRODUCERS AND ACCESSORIES	11,226,267	3.61%	405,187	3.61%	405,187	0.00%	0
343.01	PRIME MOVERS	225,135,915	3.55%	8,000,956	3.55%	8,000,956	0.00%	0
344.01	GENERATORS	26,444,860	3.42%	905,354	3.42%	905,354	0.00%	0
345.01	ACCESSORY ELECTRIC EQUIPMENT	106,086,540	3.49%	3,703,650	3.49%	3,703,650	0.00%	0
346.01	MISCELLANEOUS POWER PLANT EQUIPMENT	59,815,446	3.72%	2,223,005	3.72%	2,223,005	0.00%	0
	TOTAL OTHER PRODUCTION	573,661,582	3.54%	20,315,006	3.54%	20,315,006	0.00%	0
	OTHER PRODUCTION PLANT - SOLAR							
341.02	STRUCTURES AND IMPROVEMENTS - SOLAR	68,576,049	4.01%	2,752,148	4.01%	2,752,148	0.00%	0
344.02	GENERATORS - SOLAR	400,210,204	4.02%	16,098,303	4.02%	16,098,303	0.00%	0
345.02	ACCESSORY ELECTRIC EQUIPMENT - SOLAR INVERTERS	51,391,434	14.51%	7,457,291	14.51%	7,457,291	0.00%	0
345.03	ACCESSORY ELECTRIC EQUIPMENT - SOLAR	54,366,537	4.02%	2,186,325	4.02%	2,186,325	0.00%	0
346.02	MISCELLANEOUS POWER PLANT EQUIPMENT - SOLAR	33,461,385	4.05%	1,356,782	4.05%	1,356,782	0.00%	0
	TOTAL OTHER PRODUCTION PLANT - SOLAR	608,005,609	4.91%	29,850,849	4.91%	29,850,849	0.00%	0
344.04	GENERATORS - FUEL CELL	20,481,897	14.14%	2,896,525	14.14%	2,896,525	0.00%	0
	TOTAL HYDRO PRODUCTION PLANT	1,202,149,088	4.41%	53,062,380	4.41%	53,062,380	0.00%	0
	TOTAL PRODUCTION PLANT	5,935,225,737	3.29%	195,124,165	3.29%	195,124,165	0.00%	0
	Transmission Plant							

Detailed Rate Comparison

Account No.	Description	[1] Plant 12/31/2017	[2] PG&E Proposal Rate	PG&E Proposal Annual Accrual	[3] TURN Proposal Rate	TURN Proposal Annual Accrual	[4] TURN Adjustment Rate	TURN Adjustment Annual Accrual
350.02	LAND RIGHTS	3,788,453	1.29%	48,837	1.29%	48,837	0.00%	0
352.01	STRUCTURES AND IMPROVEMENTS	450,834	1.35%	6,075	1.35%	6,075	0.00%	0
353.01	STATION EQUIPMENT	37,595,747	3.65%	1,370,638	3.65%	1,370,638	0.00%	0
353.02	STATION EQUIPMENT - STEP UP TRANSFORMERS	104,639,469	0.64%	669,768	0.55%	574,182	-0.09%	-95,585
353.03	STATION EQUIPMENT - STEP UP TRANSFORMERS (COMBINED CYCLE)	66,787,071	3.63%	2,423,795	1.39%	930,737	-2.24%	-1,493,058
354.00	TOWERS AND FIXTURES	56,867,020	2.44%	1,389,509	2.44%	1,389,509	0.00%	0
354.01	TOWERS AND FIXTURES (COMBINED CYCLE)	15,880,036	6.88%	1,093,037	6.88%	1,093,037	0.00%	0
355.00	POLES AND FIXTURES	45,696,232	3.26%	1,489,244	3.01%	1,373,709	-0.25%	-115,535
356.00	OVERHEAD CONDUCTORS AND DEVICES	69,538,421	2.99%	2,079,205	2.99%	2,079,205	0.00%	0
356.01	OVERHEAD CONDUCTORS AND DEVICES (COMBINED CYCLE)	3,784,153	7.96%	301,334	7.96%	301,334	0.00%	0
357.00	UNDERGROUND CONDUIT	1,621,375	0.94%	15,207	0.94%	15,207	0.00%	0
358.00	UNDERGROUND CONDUCTORS AND DEVICES	3,394,950	1.49%	50,642	1.49%	50,642	0.00%	0
359.00	ROADS AND TRAILS	32,939	1.59%	524	1.59%	524	0.00%	0
	TOTAL TRANSMISSION PLANT	410,076,700	2.67%	10,937,814	2.25%	9,233,636	-0.42%	-1,704,178
	Distribution Plant							
360.02	LAND RIGHTS	117,390,024	3.31%	3,885,689	3.31%	3,885,689	0.00%	0
361.01	STRUCTURES AND IMPROVEMENTS	284,313,911	1.59%	4,531,405	1.59%	4,531,405	0.00%	0
361.02	STRUCTURES AND IMPROVEMENTS - EQUIPMENT	38,598,095	1.66%	639,297	1.66%	639,297	0.00%	0
362.00	STATION EQUIPMENT	3,344,027,700	3.61%	120,879,377	2.76%	92,258,707	-0.85%	-28,620,671
363.00	STORAGE BATTERY EQUIPMENT	1,090,084	3.74%	40,768	3.74%	40,768	0.00%	0
363.01	ENERGY STORAGE	32,142,500	6.62%	2,127,810	6.62%	2,127,810	0.00%	0
364.00	POLES, TOWERS AND FIXTURES	4,322,567,464	6.83%	295,127,243	5.19%	224,263,768	-1.64%	-70,863,476
365.00	OVERHEAD CONDUCTORS AND DEVICES	4,716,483,485	4.26%	200,692,225	3.29%	155,364,176	-0.97%	-45,328,049
366.00	UNDERGROUND CONDUIT	2,861,362,451	2.41%	69,044,371	2.18%	62,482,520	-0.23%	-6,561,851
367.00	UNDERGROUND CONDUCTORS AND DEVICES	4,554,288,320	3.54%	161,329,436	3.19%	145,405,798	-0.35%	-15,923,638
368.01	LINE TRANSFORMERS - OVERHEAD	2,623,692,892	4.83%	126,621,355	4.18%	109,678,177	-0.65%	-16,943,178
368.02	LINE TRANSFORMERS - UNDERGROUND	827,705,838	3.91%	32,366,190	3.91%	32,366,190	0.00%	0
369.01	SERVICES - OVERHEAD	899,972,727	3.98%	35,778,732	3.61%	32,497,750	-0.37%	-3,280,982
369.02	SERVICES - UNDERGROUND	2,372,355,838	2.71%	64,282,508	2.48%	58,889,993	-0.23%	-5,392,516
370.01	METERS	1,157,714,445	6.86%	79,459,050	6.86%	79,459,050	0.00%	0
371.00	INSTALLATIONS ON CUSTOMERS' PREMISES	27,313,911	0.00%	0	0.00%	0	0.00%	0
372.00	LEASED PROPERTY ON CUSTOMERS' PREMISES	895,448	0.00%	0	0.00%	0	0.00%	0
373.01	STREET LIGHTING AND SIGNAL SYSTEMS - OVERHEAD CONDUCTOR	13,247,640	3.80%	503,831	3.80%	503,830	0.00%	0
373.02	STREET LIGHTING AND SIGNAL SYSTEMS - CONDUIT AND CABLE	42,504,962	2.87%	1,220,439	2.87%	1,220,439	0.00%	0
373.03	STREET LIGHTING AND SIGNAL SYSTEMS - LAMPS AND EQUIPMENT	115,047,222	3.01%	3,467,004	3.01%	3,467,004	0.00%	0
373.04	STREET LIGHTING AND SIGNAL SYSTEMS - ELECTROLIERS	61,036,012	3.78%	2,305,071	3.78%	2,305,071	0.00%	0
	TOTAL DISTRIBUTION PLANT	28,413,750,969	4.24%	1,204,301,802	3.56%	1,011,387,443	-0.68%	-192,914,359

Detailed Rate Comparison

		[1]	[2]		[3]		[4]	
			PG&E Proposal		TURN Proposal		TURN Adjustment	
Account No.	Description	Plant 12/31/2017	Rate	Annual Accrual	Rate	Annual Accrual	Rate	Annual Accrual
	General Plant							
389.02	LAND RIGHTS	414,586	2.99%	12,379	2.99%	12,379	0.00%	0
390.00	STRUCTURES AND IMPROVEMENTS	11,254,863	1.58%	177,391	1.58%	177,391	0.00%	0
391.00	OFFICE FURNITURE AND EQUIPMENT	11,281,464	5.93%	668,819	5.93%	668,819	0.00%	0
394.00	TOOLS, SHOP AND GARAGE EQUIPMENT	129,933,248	3.94%	5,116,295	3.94%	5,116,295	0.00%	0
395.00	LABORATORY EQUIPMENT	14,556,150	4.74%	690,411	4.74%	690,411	0.00%	0
396.00	POWER OPERATED EQUIPMENT	271,024	7.89%	21,374	7.89%	21,374	0.00%	0
397.00	COMMUNICATION EQUIPMENT	284,906,076	6.92%	19,709,822	6.92%	19,709,822	0.00%	0
397.08	AMI COMMUNICATION NETWORK	6,102,951	4.96%	302,920	4.96%	302,920	0.00%	0
398.00	MISCELLANEOUS EQUIPMENT	11,390,743	6.85%	780,043	6.85%	780,043	0.00%	0
	TOTAL GENERAL PLANT	470,111,106	5.85%	27,479,454	5.85%	27,479,454	0.00%	0
	TOTAL ELECTRIC DIVISION STUDIED	**35,347,226,681**	**4.08%**	**1,441,217,375**	**3.53%**	**1,246,196,089**	**-0.55%**	**-195,021,286**

GAS DIVISION

		[1]	[2]		[3]		[4]	
Account No.	Description	Plant 12/31/2017	Rate	Annual Accrual	Rate	Annual Accrual	Rate	Annual Accrual
	Intangible Plant							
302.02	FRANCHISES AND CONSENTS	674,445	1.02%	6,912	1.02%	6,912	0.00%	0
303.02	SOFTWARE	12,936,413	49.82%	6,444,760	9.31%	1,204,610	-40.51%	-5,240,151
	TOTAL INTANGIBLE PLANT	13,610,858	47.40%	6,451,672	8.90%	1,211,521	-38.50%	-5,240,151
	Production Plant							
304.02	LAND RIGHTS	47,837	3.28%	1,569	3.28%	1,569	0.00%	0
305.00	STRUCTURES AND IMPROVEMENTS - EQUIPMENT	129,821	0.00%	0	0.00%	0	0.00%	0
311.00	LIQUEFIED PETROLUEM GAS EQUIPMENT	329,581	2.22%	7,331	2.22%	7,331	0.00%	0
	TOTAL PRODUCTION PLANT	507,239	1.75%	8,900	1.75%	8,900	0.00%	0
	Local Storage Plant							

Detailed Rate Comparison

		[1]	[2]		[3]		[4]	
			PG&E Proposal		TURN Proposal		TURN Adjustment	
Account No.	Description	Plant 12/31/2017	Rate	Annual Accrual	Rate	Annual Accrual	Rate	Annual Accrual
360.02	LAND RIGHTS	117,010	2.60%	3,044	2.60%	3,044	0.00%	0
361.01	STRUCTURES AND IMPROVEMENTS	1,556,229	1.07%	16,665	1.07%	16,665	0.00%	0
362.00	GAS HOLDERS	5,936,663	2.87%	170,369	2.87%	170,369	0.00%	0
363.30	COMPRESSOR EQUIPMENT	607,899	0.18%	1,077	0.18%	1,077	0.00%	0
363.40	MEASURING AND REGULATING EQUIPMENT	1,693,012	3.26%	55,276	3.26%	55,276	0.00%	0
363.50	OTHER EQUIPMENT	6,436,226	2.59%	166,907	2.59%	166,907	0.00%	0
	TOTAL LOCAL STORAGE PLANT	16,347,040	2.53%	413,338	2.53%	413,338	0.00%	0
	Distribution Plant							
374.02	LAND RIGHTS	29,130,463	2.67%	778,636	2.67%	778,636	0.00%	0
375.00	STRUCTURES AND IMPROVEMENTS	26,606,548	1.70%	452,595	1.70%	452,595	0.00%	0
376.00	MAINS	4,020,254,219	2.60%	104,703,902	2.26%	90,715,543	-0.34%	-13,988,358
377.00	COMPRESSOR STATION EQUIPMENT	4,378,847	3.23%	141,581	3.23%	141,581	0.00%	0
378.00	MEASURING AND REGULATING STATION EQUIPMENT	371,620,642	2.39%	8,886,436	2.20%	8,187,365	-0.19%	-699,071
380.00	SERVICES	4,301,298,200	3.14%	134,860,079	1.73%	74,389,714	-1.41%	-60,470,365
381.00	METERS	1,065,849,297	5.93%	63,167,026	5.42%	57,762,671	-0.51%	-5,404,355
383.00	HOUSE REGULATORS	186,909,427	3.91%	7,315,216	3.91%	7,315,216	0.00%	0
385.00	INDUSTRIAL MEASURING AND REGULATING STATION EQUIPMENT	79,195,454	2.25%	1,785,667	2.25%	1,785,667	0.00%	0
386.00	OTHER PROPERTY ON CUSTOMER PREMISES	165,632	2.52%	4,167	2.52%	4,167	0.00%	0
387.00	OTHER EQUIPMENT	55,826,385	5.08%	2,836,243	5.08%	2,836,243	0.00%	0
	TOTAL DISTRIBUTION PLANT	10,141,235,114	3.20%	324,931,547	2.41%	244,369,398	-0.79%	-80,562,149
	General Plant							
389.02	LAND RIGHTS	51,020	2.83%	1,446	2.83%	1,446	0.00%	0
390.00	STRUCTURES AND IMPROVEMENTS	100,813,351	2.13%	2,144,160	2.13%	2,144,160	0.00%	0
391.00	OFFICE FURNITURE AND EQUIPMENT	7,499,196	5.18%	388,614	5.18%	388,614	0.00%	0
394.00	TOOLS, SHOP AND GARAGE EQUIPMENT	43,082,586	4.11%	1,768,975	4.11%	1,768,975	0.00%	0
395.00	LABORATORY EQUIPMENT	3,416,321	5.07%	173,342	5.07%	173,342	0.00%	0
397.00	COMMUNICATION EQUIPMENT	25,142,109	6.87%	1,727,687	6.87%	1,727,687	0.00%	0
397.08	COMMUNICATION EQUIPMENT - AMI	123,381,976	5.51%	6,804,127	5.51%	6,804,127	0.00%	0
398.00	MISCELLANEOUS EQUIPMENT	9,176,581	6.50%	596,136	6.50%	596,136	0.00%	0
	TOTAL GENERAL PLANT	312,563,139	4.35%	13,604,486	4.35%	13,604,486	0.00%	0
	TOTAL GAS DIVISION STUDIED	**10,484,263,390**	**3.29%**	**345,409,944**	**2.48%**	**259,607,644**	**-0.82%**	**-85,802,299**

Detailed Rate Comparison

Account No.	Description	[1] Plant 12/31/2017	[2] PG&E Proposal Rate	[2] PG&E Proposal Annual Accrual	[3] TURN Proposal Rate	[3] TURN Proposal Annual Accrual	[4] TURN Adjustment Rate	[4] TURN Adjustment Annual Accrual
	COMMON DIVISION							
	Common Plant							
303.01	MISCELLANEOUS INTANGIBLE PLANT	6,464,457	3.39%	218,912	3.39%	218,912	0.00%	0
303.02	SOFTWARE	1,068,849,002	17.36%	185,584,923	5.57%	59,531,519	-11.79%	-126,053,405
303.04	SOFTWARE CIS	541,029,430	9.01%	48,759,503	9.01%	48,759,503	0.00%	0
389.02	LAND RIGHTS	11,154,948	2.58%	288,332	2.58%	288,332	0.00%	0
390.00	STRUCTURES AND IMPROVEMENTS	1,613,428,916	1.97%	31,733,072	1.97%	31,733,072	0.00%	0
391.01	OFFICE MACHINES AND COMPUTER EQUIPMENT	270,008,142	27.31%	73,749,831	27.31%	73,749,831	0.00%	0
391.02	PC HARDWARE	94,231,909	14.17%	13,352,179	14.17%	13,352,180	0.00%	0
391.03	OFFICE FURNITURE AND EQUIPMENT	115,844,436	7.50%	8,691,450	7.50%	8,691,450	0.00%	0
392.01	TRANSPORTATION EQUIPMENT - AIR	27,061,285	1.36%	366,810	1.36%	366,810	0.00%	0
392.02	TRANSPORTATION EQUIPMENT - CLASS P	6,117,717	13.48%	824,551	13.48%	824,551	0.00%	0
392.03	TRANSPORTATION EQUIPMENT - CLASS C2	42,466,906	9.92%	4,212,421	9.92%	4,212,421	0.00%	0
392.04	TRANSPORTATION EQUIPMENT - CLASS C4	58,556,250	10.13%	5,929,981	10.13%	5,929,980	0.00%	0
392.05	TRANSPORTATION EQUIPMENT - CLASS T1	89,570,203	10.11%	9,054,195	10.11%	9,054,195	0.00%	0
392.06	TRANSPORTATION EQUIPMENT - CLASS T3	375,988,478	9.10%	34,201,063	9.10%	34,201,063	0.00%	0
392.07	TRANSPORTATION EQUIPMENT - CLASS T4	422,673,119	6.82%	28,827,108	6.82%	28,827,108	0.00%	0
392.08	TRANSPORTATION EQUIPMENT - VESSELS	1,086,930	4.15%	45,132	4.15%	45,132	0.00%	0
392.09	TRANSPORTATION EQUIPMENT - TRAILERS	40,760,068	3.07%	1,249,483	3.07%	1,249,483	0.00%	0
393.00	STORES EQUIPMENT	9,328,075	6.25%	583,404	6.25%	583,404	0.00%	0
394.00	TOOLS, SHOP AND GARAGE EQUIPMENT	68,501,094	3.34%	2,289,808	3.34%	2,289,808	0.00%	0
395.00	LABORATORY EQUIPMENT	8,351,834	7.77%	649,187	7.77%	649,187	0.00%	0
396.00	POWER OPERATED EQUIPMENT	171,355,473	6.45%	11,051,670	6.45%	11,051,670	0.00%	0
397.01	COMMUNICATION EQUIPMENT - NON-COMPUTER	35,835,077	14.45%	5,179,216	14.45%	5,179,215	0.00%	0
397.02	COMMUNICATION EQUIPMENT - COMPUTER	138,273,161	20.47%	28,297,662	20.47%	28,297,663	0.00%	0
397.03	COMMUNICATION EQUIPMENT - RADIO SYSTEMS	82,080,515	15.25%	12,515,846	15.25%	12,515,846	0.00%	0
397.04	COMMUNICATION EQUIPMENT - VOICE SYSTEMS	27,046,808	14.61%	3,952,592	14.61%	3,952,592	0.00%	0
397.05	COMMUNICATION EQUIPMENT - TRANSMISSION SYSTEMS	429,432,879	4.79%	20,584,615	4.79%	20,584,615	0.00%	0
397.06	COMMUNICATION EQUIPMENT - TRANSMISSION SYSTEMS, GAS AMI	329,771,154	5.14%	16,965,109	5.14%	16,965,109	0.00%	0
397.07	COMMUNICATION EQUIPMENT - TRANSMISSION SYSTEMS, ELECTRIC AMI	117,075	0.83%	975	0.83%	975	0.00%	0
397.08	AMI COMMUNICATION NETWORK	120,857,576	4.87%	5,885,505	4.87%	5,885,505	0.00%	0
398.00	MISCELLANEOUS EQUIPMENT	37,731,921	5.36%	2,023,223	5.36%	2,023,223	0.00%	0
399.00	OTHER TANGIBLE PROPERTY	679	0.21%	1	0.22%	1	0.01%	0
	TOTAL COMMON DIVISION STUDIED	**6,243,975,518**	**8.92%**	**557,067,760**	**6.90%**	**431,014,355**	**-2.02%**	**-126,053,404**

Detailed Rate Comparison

		[1]	[2]		[3]		[4]	
			PG&E Proposal		TURN Proposal		TURN Adjustment	
Account No.	Description	Plant 12/31/2017	Rate	Annual Accrual	Rate	Annual Accrual	Rate	Annual Accrual
	TOTAL DEPRECIABLE PLANT STUDIED	**52,075,465,588**	**4.50%**	**2,343,695,078**	**3.72%**	**1,936,818,089**	**-0.78%**	**-406,876,989**

[1], [2] Depreciation Study
[3] From Exhibit DJG-5
[4] = [3] - [2]

Depreciation Rate Development

		[1]	[2]		[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
Account No.	Description	Original Cost	Iowa Curve Type	AL	Net Salvage	Depreciable Base	Book Reserve	Future Accruals	Remaining Life	Service Life Accrual	Service Life Rate	Net Salvage Accrual	Net Salvage Rate	Total Accrual	Total Rate
	ELECTRIC DIVISION														
	Intangible Plant														
302.01	FRANCHISES AND CONSENTS	113,935,938	SQ	-	0%	113,935,938	57,228,270	56,707,668	20.73	2,735,536	2.40%	0	0.00%	2,735,536	**2.40%**
303.01	USBR - LIMITED TERM ELECTRIC	999,605			0%	999,605	999,605	0							
303.03	COMPUTER SOFTWARE	3,126,625	SQ	10	0%	3,126,625	1,255,518	1,871,108	7.93	235,855	7.54%	0	0.00%	235,855	**7.54%**
	TOTAL INTANGIBLE PLANT	118,062,168			0.0%	118,062,168	59,483,393	58,578,776	19.71	2,971,391	2.52%	0	0.00%	2,971,391	**2.52%**
	Steam Production Plant														
310.02	LAND RIGHTS	4,801,315	SQ	-	0%	4,801,315	188,211	4,613,104	22.50	205,027	4.27%	0	0.00%	205,027	**4.27%**
311.03	STRUCTURES AND IMPROVEMENTS	111,035,153	R1	75	0%	111,035,153	31,364,189	79,670,964	20.94	3,804,726	3.43%	0	0.00%	3,804,726	**3.43%**
312.03	BOILER PLANT EQUIPMENT	271,890,028	R1	50	0%	271,890,028	71,669,795	200,220,233	20.33	9,848,511	3.62%	0	0.00%	9,848,511	**3.62%**
312.05	BOILER PLANT EQUIPMENT - POLLUTION CONTROL	1,473,122	R1	50	0%	1,473,122	462,372	1,010,750	19.69	51,333	3.48%	0	0.00%	51,333	**3.48%**
314.03	TURBOGENERATOR UNITS	240,186,384	R2.5	40	0%	240,186,384	65,535,582	174,650,802	20.51	8,515,397	3.55%	0	0.00%	8,515,397	**3.55%**
315.03	ACCESSORY ELECTRIC EQUIPMENT	51,649,878	R2.5	45	0%	51,649,878	12,960,696	38,689,182	20.87	1,853,818	3.59%	0	0.00%	1,853,818	**3.59%**
316.03	MISCELLANEOUS POWER PLANT EQUIPMENT	25,616,853	S0.5	40	0%	25,616,853	7,134,902	18,481,951	19.51	947,307	3.70%	0	0.00%	947,307	**3.70%**
	TOTAL STEAM PRODUCTION PLANT	706,652,732			0.0%	706,652,732	189,315,747	517,336,985	20.51	25,226,119	3.57%	0	0.00%	25,226,119	**3.57%**
	Hydro Production Plant														
	HYDRO PRODUCTION														
330.04	LAND RIGHTS	15,021,265	SQ	-	0%	15,021,265	624,815	14,396,451	20.63	697,841	4.65%	0	0.00%	697,841	**4.65%**
330.05	LAND RIGHTS - FISH AND WILDLIFE	5,973	SQ	-	0%	5,973	384	5,589	12.53	446	7.47%	0	0.00%	446	**7.47%**
330.06	LAND RIGHTS - RECREATION	2,283,503	SQ	-	0%	2,283,503	194,098	2,089,405	8.87	235,559	10.32%	0	0.00%	235,559	**10.32%**
331.00	STRUCTURES AND IMPROVEMENTS	325,023,328	R2	80	-6%	344,524,727	120,221,318	224,303,409	19.13	10,705,803	3.29%	1,019,415	0.31%	11,725,217	**3.61%**
332.00	RESERVOIRS, DAMS AND WATERWAYS	1,655,699,718	R2.5	120	-3%	1,705,370,710	894,158,434	811,212,276	22.15	34,381,096	2.08%	2,242,483	0.14%	36,623,579	**2.21%**
333.00	WATERWHEELS, TURBINES AND GENERATORS	732,172,381	S0	70	-4%	761,459,277	215,708,468	545,750,809	18.11	28,518,162	3.90%	1,617,167	0.22%	30,135,329	**4.12%**
334.00	ACCESSORY ELECTRIC EQUIPMENT	214,917,509	S0.5	65	-6%	227,812,560	78,297,480	149,515,080	20.77	6,577,758	3.06%	620,850	0.29%	7,198,608	**3.35%**
335.00	MISCELLANEOUS POWER PLANT EQUIPMENT	76,959,518	S0	55	-10%	84,655,470	24,277,291	60,378,179	18.38	2,866,280	3.72%	418,713	0.54%	3,284,993	**4.27%**
336.00	ROADS, RAILROADS AND BRIDGES	76,283,921	S1	80	-3%	78,572,438	29,243,343	49,329,095	19.58	2,402,481	3.15%	116,880	0.15%	2,519,361	**3.30%**
	TOTAL HYDRO PRODUCTION	3,098,367,117			-3.9%	3,219,705,923	1,362,725,631	1,856,980,292	20.09	86,385,425	2.79%	6,035,508	0.19%	92,420,933	**2.98%**
	HELMS PUMPED STORAGE														
330.04	LAND RIGHTS	348	SQ	-	0%	348	30	318	8.38	38	10.89%	0	0.00%	38	**10.89%**
331.00	STRUCTURES AND IMPROVEMENTS	174,350,546	R2	80	-6%	184,811,579	163,924,102	20,887,476	8.20	1,271,518	0.73%	1,275,736	0.73%	2,547,253	**1.46%**
332.00	RESERVOIRS, DAMS AND WATERWAYS	428,057,493	R2.5	120	-3%	440,899,217	412,511,539	28,387,678	8.28	1,877,531	0.44%	1,550,933	0.36%	3,428,464	**0.80%**
333.00	WATERWHEELS, TURBINES AND GENERATORS	240,394,729	S0	70	-4%	250,010,518	119,901,717	130,108,801	8.19	14,712,211	6.12%	1,174,089	0.49%	15,886,300	**6.61%**
334.00	ACCESSORY ELECTRIC EQUIPMENT	56,131,783	S0.5	65	-6%	59,499,690	46,639,422	12,860,268	8.10	1,171,896	2.09%	415,791	0.74%	1,587,687	**2.83%**
335.00	MISCELLANEOUS POWER PLANT EQUIPMENT	20,398,178	S0	55	-10%	22,437,996	15,075,573	7,362,424	8.04	662,016	3.25%	253,709	1.24%	915,724	**4.49%**
336.00	ROADS, RAILROADS AND BRIDGES	8,723,723	S1	80	-3%	8,985,435	8,585,394	400,041	8.12	17,036	0.20%	32,231	0.37%	49,266	**0.56%**
	TOTAL HELMS PUMPED STORAGE	928,056,800			-4.2%	966,644,784	766,637,778	200,007,006	8.19	19,712,245	2.12%	4,702,488	0.51%	24,414,733	**2.63%**
	TOTAL HYDRO PRODUCTION PLANT	4,026,423,917			-4.0%	4,186,350,707	2,129,363,409	2,056,987,298	17.61	106,097,670	2.64%	10,737,996	0.27%	116,835,666	**2.90%**
	Other Production Plant														
	OTHER PRODUCTION														
340.02	LAND RIGHTS	3,120,988	SQ	-	0%	3,120,988	122,343	2,998,645	22.51	133,214	4.27%	0	0.00%	133,214	**4.27%**
341.01	STRUCTURES AND IMPROVEMENTS	141,831,567	R1	75	0%	141,831,567	36,828,649	105,002,917	21.24	4,943,640	3.49%	0	0.00%	4,943,640	**3.49%**
342.01	FUEL HOLDERS, PRODUCERS AND ACCESSORIES	11,226,267	R1	50	0%	11,226,267	2,944,244	8,282,023	20.44	405,187	3.61%	0	0.00%	405,187	**3.61%**
343.01	PRIME MOVERS	225,135,915	R2.5	40	0%	225,135,915	59,676,155	165,459,760	20.68	8,000,956	3.55%	0	0.00%	8,000,956	**3.55%**
344.01	GENERATORS	26,444,860	R2.5	40	0%	26,444,860	7,559,178	18,885,683	20.86	905,354	3.42%	0	0.00%	905,354	**3.42%**
345.01	ACCESSORY ELECTRIC EQUIPMENT	106,086,540	R2.5	45	0%	106,086,540	28,346,930	77,739,610	20.99	3,703,650	3.49%	0	0.00%	3,703,650	**3.49%**
346.01	MISCELLANEOUS POWER PLANT EQUIPMENT	59,815,446	S0.5	40	0%	59,815,446	16,266,768	43,548,677	19.59	2,223,005	3.72%	0	0.00%	2,223,005	**3.72%**
	TOTAL OTHER PRODUCTION	573,661,582			0.0%	573,661,582	151,744,266	421,917,316	20.77	20,315,006	3.54%	0	0.00%	20,315,006	**3.54%**
	OTHER PRODUCTION PLANT - SOLAR														
341.02	STRUCTURES AND IMPROVEMENTS - SOLAR	68,576,049	SQ	-	0%	68,576,049	15,019,249	53,556,800	19.46	2,752,148	4.01%	0	0.00%	2,752,148	**4.01%**
344.02	GENERATORS - SOLAR	400,210,204	SQ	-	0%	400,210,204	87,903,133	312,307,071	19.40	16,098,303	4.02%	0	0.00%	16,098,303	**4.02%**

Depreciation Rate Development

		[1]	[2]		[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
Account No.	Description	Original Cost	Iowa Curve Type	AL	Net Salvage	Depreciable Base	Book Reserve	Future Accruals	Remaining Life	Service Life Accrual	Service Life Rate	Net Salvage Accrual	Net Salvage Rate	Total Accrual	Total Rate
345.02	ACCESSORY ELECTRIC EQUIPMENT - SOLAR INVERTERS	51,391,434	S2.5 -	10	0%	51,391,434	15,148,999	36,242,436	4.86	7,457,291	14.51%	0	0.00%	7,457,291	**14.51%**
345.03	ACCESSORY ELECTRIC EQUIPMENT - SOLAR	54,366,537	SQ -		0%	54,366,537	11,798,798	42,567,739	19.47	2,186,325	4.02%	0	0.00%	2,186,325	**4.02%**
346.02	MISCELLANEOUS POWER PLANT EQUIPMENT - SOLAR	33,461,385	SQ -		0%	33,461,385	8,876,492	24,584,893	18.12	1,356,782	4.05%	0	0.00%	1,356,782	**4.05%**
	TOTAL OTHER PRODUCTION PLANT - SOLAR	608,005,609			0.0%	608,005,609	138,746,670	469,258,938	15.72	29,850,849	4.91%	0	0.00%	29,850,849	**4.91%**
344.04	GENERATORS - FUEL CELL	20,481,897	SQ -		0%	20,481,897	10,344,059	10,137,838	3.50	2,896,525	14.14%	0	0.00%	2,896,525	**14.14%**
	TOTAL HYDRO PRODUCTION PLANT	1,202,149,088			0.0%	1,202,149,088	300,834,996	901,314,092	16.99	53,062,380	4.41%	0	0.00%	53,062,380	**4.41%**
	TOTAL PRODUCTION PLANT	5,935,225,737			-2.7%	6,095,152,527	2,619,514,152	3,475,638,374	17.81	184,386,169	3.11%	10,737,996	0.18%	195,124,165	**3.29%**
	Transmission Plant														
350.02	LAND RIGHTS	3,788,453	SQ -	75	0%	3,788,453	1,207,894	2,580,559	52.84	48,837	1.29%	0	0.00%	48,837	**1.29%**
352.01	STRUCTURES AND IMPROVEMENTS	450,834	R3 -	70	-20%	541,001	192,135	348,866	57.43	4,505	1.00%	1,570	0.35%	6,075	**1.35%**
353.01	STATION EQUIPMENT	37,595,747	R2 -	46	-60%	60,153,195	8,219,734	51,933,461	37.89	775,297	2.06%	595,340	1.58%	1,370,638	**3.65%**
353.02	STATION EQUIPMENT - STEP UP TRANSFORMERS	104,639,469	R1.5 -	61	-5%	109,871,443	86,898,408	22,973,034	40.01	443,416	0.42%	130,767	0.12%	574,182	**0.55%**
353.03	STATION EQUIPMENT - STEP UP TRANSFORMERS (COMBINED CYCLE)	66,787,071	R1.5 -	61	-5%	70,126,424	18,935,874	51,190,550	55.00	870,022	1.30%	60,716	0.09%	930,737	**1.39%**
354.00	TOWERS AND FIXTURES	56,867,020	R4 -	75	-100%	113,734,039	34,573,721	79,160,318	56.97	391,316	0.69%	998,192	1.76%	1,389,509	**2.44%**
354.01	TOWERS AND FIXTURES (COMBINED CYCLE)	15,880,036	R4 -	75	-100%	31,760,071	7,221,385	24,538,686	22.45	385,686	2.43%	707,351	4.45%	1,093,037	**6.88%**
355.00	POLES AND FIXTURES	45,696,232	R1.5 -	58	-80%	82,253,217	13,018,284	69,234,933	50.40	648,372	1.42%	725,337	1.59%	1,373,709	**3.01%**
356.00	OVERHEAD CONDUCTORS AND DEVICES	69,538,421	R2 -	65	-110%	146,030,684	38,099,139	107,931,544	51.91	605,650	0.87%	1,473,555	2.12%	2,079,205	**2.99%**
356.01	OVERHEAD CONDUCTORS AND DEVICES (COMBINED CYCLE)	3,784,153	R2 -	65	-110%	7,946,722	1,386,685	6,560,037	21.77	110,127	2.91%	191,207	5.05%	301,334	**7.96%**
357.00	UNDERGROUND CONDUIT	1,621,375	R4 -	65	0%	1,621,375	788,025	833,351	54.80	15,207	0.94%	0	0.00%	15,207	**0.94%**
358.00	UNDERGROUND CONDUCTORS AND DEVICES	3,394,950	R3 -	55	-10%	3,734,445	1,521,882	2,212,563	43.69	42,872	1.26%	7,771	0.23%	50,642	**1.49%**
359.00	ROADS AND TRAILS	32,939	R1.5 -	60	-10%	36,233	8,590	27,643	52.77	461	1.40%	62	0.19%	524	**1.59%**
	TOTAL TRANSMISSION PLANT	410,076,700			-54.0%	631,597,303	212,071,758	419,525,545	45.43	4,341,768	1.06%	4,891,868	1.19%	9,233,636	**2.25%**
	Distribution Plant														
360.02	LAND RIGHTS	117,390,024	SQ -	60	0%	117,390,024	3,306,200	114,083,824	29.36	3,885,689	3.31%	0	0.00%	3,885,689	**3.31%**
361.01	STRUCTURES AND IMPROVEMENTS	284,313,911	R3 -	70	-20%	341,176,693	97,976,201	243,200,492	53.67	3,471,916	1.22%	1,059,489	0.37%	4,531,405	**1.59%**
361.02	STRUCTURES AND IMPROVEMENTS - EQUIPMENT	38,598,095	R3 -	70	-20%	46,317,714	10,657,737	35,659,977	55.78	500,903	1.30%	138,394	0.36%	639,297	**1.66%**
362.00	STATION EQUIPMENT	3,344,027,700	R1.5 -	52	-45%	4,848,840,165	975,819,648	3,873,020,516	41.98	56,412,769	1.69%	35,845,938	1.07%	92,258,707	**2.76%**
363.00	STORAGE BATTERY EQUIPMENT	1,090,084	R2 -	20	0%	1,090,084	555,205	534,879	13.12	40,768	3.74%	0	0.00%	40,768	**3.74%**
363.01	ENERGY STORAGE	32,142,500	S3 -	15	0%	32,142,500	10,502,673	21,639,826	10.17	2,127,810	6.62%	0	0.00%	2,127,810	**6.62%**
364.00	POLES, TOWERS AND FIXTURES	4,322,567,464	R2 -	51	-156%	11,065,772,707	2,171,471,672	8,894,301,036	39.66	54,238,421	1.25%	170,025,347	3.93%	224,263,768	**5.19%**
365.00	OVERHEAD CONDUCTORS AND DEVICES	4,716,483,485	R2 -	52	-86%	8,772,659,281	2,547,216,733	6,225,442,548	40.07	54,136,929	1.15%	101,227,247	2.15%	155,364,176	**3.29%**
366.00	UNDERGROUND CONDUIT	2,861,362,451	R4 -	70	-50%	4,292,043,676	1,017,959,616	3,274,084,060	52.40	35,179,443	1.23%	27,303,077	0.95%	62,482,520	**2.18%**
367.00	UNDERGROUND CONDUCTORS AND DEVICES	4,554,288,320	R3 -	54	-80%	8,197,718,976	2,481,817,055	5,715,901,921	39.31	52,721,223	1.16%	92,684,575	2.04%	145,405,798	**3.19%**
368.01	LINE TRANSFORMERS - OVERHEAD	2,623,692,892	R2.5 -	34	-33%	3,489,511,547	776,073,457	2,713,438,089	24.74	74,681,465	2.85%	34,996,712	1.33%	109,678,177	**4.18%**
368.02	LINE TRANSFORMERS - UNDERGROUND	827,705,838	R2.5 -	33	-25%	1,034,632,298	260,109,372	774,522,926	23.93	23,719,033	2.87%	8,647,157	1.04%	32,366,190	**3.91%**
369.01	SERVICES - OVERHEAD	899,972,727	R2.5 -	59	-125%	2,024,938,636	646,384,075	1,378,554,561	42.42	5,978,045	0.66%	26,519,706	2.95%	32,497,750	**3.61%**
369.02	SERVICES - UNDERGROUND	2,372,355,838	R4 -	53	-45%	3,439,915,966	1,404,088,922	2,035,827,044	34.57	28,008,878	1.18%	30,881,114	1.30%	58,889,993	**2.48%**
370.01	METERS	1,157,714,445	R2 -	20	-20%	1,389,257,334	214,852,572	1,174,404,761	14.78	63,793,090	5.51%	15,665,960	1.35%	79,459,050	**6.86%**
371.00	INSTALLATIONS ON CUSTOMERS' PREMISES	27,313,911	S1 -	40	0%	27,313,911	27,313,911	0	15.77	0	0.00%	0	0.00%	0	**0.00%**
372.00	LEASED PROPERTY ON CUSTOMERS' PREMISES	895,448	L1 -	25	0%	895,448	895,447	0	7.50	0	0.00%	0	0.00%	0	**0.00%**
373.01	STREET LIGHTING AND SIGNAL SYSTEMS - OVERHEAD CONDUCTOR	13,247,640	R1 -	30	-50%	19,871,460	11,150,154	8,721,306	17.31	121,172	0.91%	382,659	2.89%	503,830	**3.80%**
373.02	STREET LIGHTING AND SIGNAL SYSTEMS - CONDUIT AND CABLE	42,504,962	S1.5 -	35	-20%	51,005,954	22,862,623	28,143,331	23.06	851,793	2.00%	368,647	0.87%	1,220,439	**2.87%**
373.03	STREET LIGHTING AND SIGNAL SYSTEMS - LAMPS AND EQUIPMENT	115,047,222	L0 -	25	-20%	138,056,667	82,688,607	55,368,060	15.97	2,026,213	1.76%	1,440,792	1.25%	3,467,004	**3.01%**
373.04	STREET LIGHTING AND SIGNAL SYSTEMS - ELECTROLIERS	61,036,012	S1.5 -	30	-25%	76,295,015	31,553,589	44,741,426	19.41	1,518,930	2.49%	786,141	1.29%	2,305,071	**3.78%**
	TOTAL DISTRIBUTION PLANT	28,413,750,969			-73.9%	49,406,846,056	12,795,255,473	36,611,590,583	36.20	463,414,489	1.63%	547,972,954	1.93%	1,011,387,443	**3.56%**
	General Plant														
389.02	LAND RIGHTS	414,586	SQ -	60	0%	414,586	11,650	402,936	32.55	12,379	2.99%	0	0.00%	12,379	**2.99%**
390.00	STRUCTURES AND IMPROVEMENTS	11,254,863	R2 -	50	-10%	12,380,350	6,350,820	6,029,529	33.99	144,279	1.28%	33,112	0.29%	177,391	**1.58%**
391.00	OFFICE FURNITURE AND EQUIPMENT	11,281,464	SQ -	20	0%	11,281,464	3,630,181	7,651,284	11.44	668,819	5.93%	0	0.00%	668,819	**5.93%**
394.00	TOOLS, SHOP AND GARAGE EQUIPMENT	129,933,248	SQ -	25	0%	129,933,248	40,705,065	89,228,183	17.44	5,116,295	3.94%	0	0.00%	5,116,295	**3.94%**
395.00	LABORATORY EQUIPMENT	14,556,150	SQ -	20	0%	14,556,150	5,007,761	9,548,389	13.83	690,411	4.74%	0	0.00%	690,411	**4.74%**
396.00	POWER OPERATED EQUIPMENT	271,024	SQ -	20	0%	271,024	260,337	10,687	0.50	21,374	7.89%	0	0.00%	21,374	**7.89%**
397.00	COMMUNICATION EQUIPMENT	284,906,076	SQ -	15	0%	284,906,076	26,904,505	258,001,571	13.09	19,709,822	6.92%	0	0.00%	19,709,822	**6.92%**

Depreciation Rate Development

		[1]	[2]		[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
Account		Original	Iowa Curve		Net	Depreciable	Book	Future	Remaining	Service Life		Net Salvage		Total	
No.	Description	Cost	Type	AL	Salvage	Base	Reserve	Accruals	Life	Accrual	Rate	Accrual	Rate	Accrual	Rate
397.08	AMI COMMUNICATION NETWORK	6,102,951	SQ	20	0%	6,102,951	1,492,511	4,610,440	15.22	302,920	4.96%	0	0.00%	302,920	**4.96%**
398.00	MISCELLANEOUS EQUIPMENT	11,390,743	SQ	20	0%	11,390,743	1,445,194	9,945,549	12.75	780,043	6.85%	0	0.00%	780,043	**6.85%**
	TOTAL GENERAL PLANT	470,111,106			-0.2%	471,236,592	85,808,025	385,428,567	14.03	27,446,342	5.84%	33,112	0.01%	27,479,454	**5.85%**
	TOTAL ELECTRIC DIVISION STUDIED	**35,347,226,681**			-60.5%	**56,722,894,646**	**15,772,132,801**	**40,950,761,845**	32.86	**682,560,159**	1.93%	**563,635,930**	1.59%	**1,246,196,089**	**3.53%**
	GAS DIVISION														
	Intangible Plant														
302.02	FRANCHISES AND CONSENTS	674,445	SQ	57	0%	674,445	562,611	111,834	16.18	6,912	1.02%	0	0.00%	6,912	**1.02%**
303.02	SOFTWARE	12,936,413	SQ	10	0%	12,936,413	4,042,644	8,893,769	7.38	1,204,610	9.31%	0	0.00%	1,204,610	**9.31%**
	TOTAL INTANGIBLE PLANT	13,610,858			0.0%	13,610,858	4,605,255	9,005,603	7.43	1,211,521	8.90%	0	0.00%	1,211,521	**8.90%**
	Production Plant														
304.02	LAND RIGHTS	47,837	SQ	60	0%	47,837	0	47,837	30.49	1,569	3.28%	0	0.00%	1,569	**3.28%**
305.00	STRUCTURES AND IMPROVEMENTS - EQUIPMENT	129,821	R3	50	-20%	155,785	155,785	0	20.75	-1,251	-0.96%	1,251	0.96%	0	**0.00%**
311.00	LIQUEFIED PETROLUEM GAS EQUIPMENT	329,581	R2.5	45	0%	329,581	53,634	275,947	37.64	7,331	2.22%	0	0.00%	7,331	**2.22%**
	TOTAL PRODUCTION PLANT	507,239			-5.1%	533,203	209,419	323,784	36.38	7,649	1.51%	1,251	0.25%	8,900	**1.75%**
	Local Storage Plant														
360.02	LAND RIGHTS	117,010	SQ	60	0%	117,010	2,890	114,120	37.49	3,044	2.60%	0	0.00%	3,044	**2.60%**
361.01	STRUCTURES AND IMPROVEMENTS	1,556,229	R3	50	-5%	1,634,041	1,281,753	352,288	21.14	12,984	0.83%	3,681	0.24%	16,665	**1.07%**
362.00	GAS HOLDERS	5,936,663	R3	50	-15%	6,827,163	4,131,926	2,695,237	15.82	114,079	1.92%	56,289	0.95%	170,369	**2.87%**
363.30	COMPRESSOR EQUIPMENT	607,899	S1	25	0%	607,899	600,340	7,559	7.02	1,077	0.18%	0	0.00%	1,077	**0.18%**
363.40	MEASURING AND REGULATING EQUIPMENT	1,693,012	R0.5	30	0%	1,693,012	131,451	1,561,561	28.25	55,276	3.26%	0	0.00%	55,276	**3.26%**
363.50	OTHER EQUIPMENT	6,436,226	R0.5	30	0%	6,436,226	2,644,092	3,792,134	22.72	166,907	2.59%	0	0.00%	166,907	**2.59%**
	TOTAL LOCAL STORAGE PLANT	16,347,040			-5.9%	17,315,351	8,792,453	8,522,898	20.62	353,368	2.16%	59,970	0.37%	413,338	**2.53%**
					41.25	**41**	**25%**								
	Distribution Plant														
374.02	LAND RIGHTS	29,130,463	SQ	60	0%	29,130,463	749,182	28,381,281	36.45	778,636	2.67%	0	0.00%	778,636	**2.67%**
375.00	STRUCTURES AND IMPROVEMENTS	26,606,548	R2	60	-5%	27,936,875	3,175,419	24,761,457	54.71	428,279	1.61%	24,316	0.09%	452,595	**1.70%**
376.01	MAINS	4,020,254,219	R3	57	-40%	5,628,355,906	1,717,608,833	3,910,747,073	43.11	53,413,254	1.33%	37,302,289	0.93%	90,715,543	**2.26%**
377.00	COMPRESSOR STATION EQUIPMENT	4,378,847	R2.5	35	0%	4,378,847	120,104	4,258,743	30.08	141,581	3.23%	0	0.00%	141,581	**3.23%**
378.00	MEASURING AND REGULATING STATION EQUIPMENT	371,620,642	R2	59	-40%	520,268,899	105,005,724	415,263,175	50.72	5,256,603	1.41%	2,930,762	0.79%	8,187,365	**2.20%**
380.00	SERVICES	4,301,298,200	R3	60	-44%	6,193,869,408	2,764,503,579	3,429,365,829	46.10	33,336,109	0.78%	41,053,605	0.95%	74,389,714	**1.73%**
381.00	METERS	1,065,849,297	S1	30	-50%	1,598,773,946	343,013,478	1,255,760,468	21.74	33,249,118	3.12%	24,513,553	2.30%	57,762,671	**5.42%**
383.00	HOUSE REGULATORS	186,909,427	R2	28	-15%	214,945,841	99,072,818	115,873,023	15.84	5,545,240	2.97%	1,769,976	0.95%	7,315,216	**3.91%**
385.00	INDUSTRIAL MEASURING AND REGULATING STATION EQUIPMENT	79,195,454	R2.5	45	-10%	87,114,999	27,866,573	59,248,426	33.18	1,546,983	1.95%	238,684	0.30%	1,785,667	**2.25%**
386.00	OTHER PROPERTY ON CUSTOMER PREMISES	165,632	R3	35	0%	165,632	104,913	60,718	14.57	4,167	2.52%	0	0.00%	4,167	**2.52%**
387.00	OTHER EQUIPMENT	55,826,385	S1.5	20	0%	55,826,385	18,671,606	37,154,779	13.10	2,836,243	5.08%	0	0.00%	2,836,243	**5.08%**
	TOTAL DISTRIBUTION PLANT	10,141,235,114			-41.6%	14,360,767,202	5,079,892,229	9,280,874,973	37.98	136,536,212	1.35%	107,833,186	1.06%	244,369,398	**2.41%**
	General Plant														
389.02	LAND RIGHTS	51,020	SQ	60	0%	51,020	1,367	49,653	34.34	1,446	2.83%	0	0.00%	1,446	**2.83%**
390.00	STRUCTURES AND IMPROVEMENTS	100,813,351	R2	50	-10%	110,894,686	12,220,463	98,674,222	46.02	1,925,095	1.91%	219,064	0.22%	2,144,160	**2.13%**
391.00	OFFICE FURNITURE AND EQUIPMENT	7,499,196	SQ	20	0%	7,499,196	1,701,078	5,798,117	14.92	388,614	5.18%	0	0.00%	388,614	**5.18%**
394.00	TOOLS, SHOP AND GARAGE EQUIPMENT	43,082,586	SQ	25	0%	43,082,586	9,418,992	33,663,594	19.03	1,768,975	4.11%	0	0.00%	1,768,975	**4.11%**
395.00	LABORATORY EQUIPMENT	3,416,321	SQ	20	0%	3,416,321	155,749	3,260,572	18.81	173,342	5.07%	0	0.00%	173,342	**5.07%**
397.00	COMMUNICATION EQUIPMENT	25,142,109	SQ	15	0%	25,142,109	1,731,947	23,410,162	13.55	1,727,687	6.87%	0	0.00%	1,727,687	**6.87%**
397.08	COMMUNICATION EQUIPMENT - AMI	123,381,976	SQ	20	0%	123,381,976	12,542,753	110,839,222	16.29	6,804,127	5.51%	0	0.00%	6,804,127	**5.51%**
398.00	MISCELLANEOUS EQUIPMENT	9,176,581	SQ	20	0%	9,176,581	2,076,603	7,099,978	11.91	596,136	6.50%	0	0.00%	596,136	**6.50%**

Depreciation Rate Development

		[1]	[2]		[3]	[4]	[5]	[6]	[7]	[8]	[9]	[10]	[11]	[12]	[13]
Account No.	Description	Original Cost	Iowa Curve Type	AL	Net Salvage	Depreciable Base	Book Reserve	Future Accruals	Remaining Life	Service Life Accrual	Service Life Rate	Net Salvage Accrual	Net Salvage Rate	Total Accrual	Total Rate
	TOTAL GENERAL PLANT	312,563,139			-3.2%	322,644,474	39,848,954	282,795,520	20.79	13,385,422	4.28%	219,064	0.07%	13,604,486	**4.35%**
	TOTAL GAS DIVISION STUDIED	**10,484,263,390**			**-40.4%**	**14,714,871,088**	**5,133,348,310**	**9,581,522,778**	**36.91**	**151,494,173**	**1.44%**	**108,113,472**	**1.03%**	**259,607,644**	**2.48%**
	COMMON DIVISION														
	Common Plant														
303.01	MISCELLANEOUS INTANGIBLE PLANT	6,464,457	SQ	30	0%	6,464,457	0	6,464,457	29.53	218,912	3.39%	0	0.00%	218,912	**3.39%**
303.02	SOFTWARE	1,068,849,002	SQ	10	0%	1,068,849,002	630,868,583	437,980,419	7.36	59,531,519	5.57%	0	0.00%	59,531,519	**5.57%**
303.04	SOFTWARE CIS	541,029,430	SQ	13	0%	541,029,430	274,314,951	266,714,479	5.47	48,759,503	9.01%	0	0.00%	48,759,503	**9.01%**
389.02	LAND RIGHTS	11,154,948	SQ	60	0%	11,154,948	273,297	10,881,652	37.74	288,332	2.58%	0	0.00%	288,332	**2.58%**
390.00	STRUCTURES AND IMPROVEMENTS	1,613,428,916	R2	50	-10%	1,774,771,808	598,744,161	1,176,027,647	37.06	27,379,513	1.70%	4,353,559	0.27%	31,733,072	**1.97%**
391.01	OFFICE MACHINES AND COMPUTER EQUIPMENT	270,008,142	SQ	5	0%	270,008,142	59,821,123	210,187,019	2.85	73,749,831	27.31%	0	0.00%	73,749,831	**27.31%**
391.02	PC HARDWARE	94,231,909	SQ	5	0%	94,231,909	67,794,594	26,437,315	1.98	13,352,180	14.17%	0	0.00%	13,352,180	**14.17%**
391.03	OFFICE FURNITURE AND EQUIPMENT	115,844,436	SQ	20	0%	115,844,436	12,676,924	103,167,512	11.87	8,691,450	7.50%	0	0.00%	8,691,450	**7.50%**
392.01	TRANSPORTATION EQUIPMENT - AIR	27,061,285	SQ	13	50%	13,530,642	12,463,224	1,067,418	2.91	5,016,516	18.54%	-4,649,705	-17.18%	366,810	**1.36%**
392.02	TRANSPORTATION EQUIPMENT - CLASS P	6,117,717	L3	8	10%	5,505,945	2,224,234	3,281,712	3.98	978,262	15.99%	-153,711	-2.51%	824,551	**13.48%**
392.03	TRANSPORTATION EQUIPMENT - CLASS C2	42,466,906	S2.5	10	10%	38,220,216	10,544,612	27,675,604	6.57	4,858,797	11.44%	-646,376	-1.52%	4,212,421	**9.92%**
392.04	TRANSPORTATION EQUIPMENT - CLASS C4	58,556,250	S2	9	10%	52,700,625	18,306,739	34,393,887	5.80	6,939,571	11.85%	-1,009,591	-1.72%	5,929,980	**10.13%**
392.05	TRANSPORTATION EQUIPMENT - CLASS T1	89,570,203	S2.5	10	10%	80,613,183	23,390,668	57,222,514	6.32	10,471,445	11.69%	-1,417,250	-1.58%	9,054,195	**10.11%**
392.06	TRANSPORTATION EQUIPMENT - CLASS T3	375,988,478	S2.5	11	10%	338,389,630	99,666,211	238,723,419	6.98	39,587,717	10.53%	-5,386,654	-1.43%	34,201,063	**9.10%**
392.07	TRANSPORTATION EQUIPMENT - CLASS T4	422,673,119	L4	15	10%	380,405,807	61,001,445	319,404,362	11.08	32,641,848	7.72%	-3,814,739	-0.90%	28,827,108	**6.82%**
392.08	TRANSPORTATION EQUIPMENT - VESSELS	1,086,930	L2	13	10%	978,237	623,951	354,286	7.85	58,978	5.43%	-13,846	-1.27%	45,132	**4.15%**
392.09	TRANSPORTATION EQUIPMENT - TRAILERS	40,760,068	L1.5	22	10%	36,684,061	17,492,001	19,192,060	15.36	1,514,848	3.72%	-265,365	-0.65%	1,249,483	**3.07%**
393.00	STORES EQUIPMENT	9,328,075	SQ	20	0%	9,328,075	2,187,214	7,140,861	12.24	583,404	6.25%	0	0.00%	583,404	**6.25%**
394.00	TOOLS, SHOP AND GARAGE EQUIPMENT	68,501,094	SQ	25	0%	68,501,094	42,763,648	25,737,446	11.24	2,289,808	3.34%	0	0.00%	2,289,808	**3.34%**
395.00	LABORATORY EQUIPMENT	8,351,834	SQ	20	0%	8,351,834	2,191,047	6,160,786	9.49	649,187	7.77%	0	0.00%	649,187	**7.77%**
396.00	POWER OPERATED EQUIPMENT	171,355,473	L3	13	20%	137,084,378	47,344,819	89,739,559	8.12	15,272,248	8.91%	-4,220,578	-2.46%	11,051,670	**6.45%**
397.01	COMMUNICATION EQUIPMENT - NON-COMPUTER	35,835,077	SQ	7	0%	35,835,077	12,114,270	23,720,807	4.58	5,179,215	14.45%	0	0.00%	5,179,215	**14.45%**
397.02	COMMUNICATION EQUIPMENT - COMPUTER	138,273,161	SQ	5	0%	138,273,161	55,361,010	82,912,151	2.93	28,297,663	20.47%	0	0.00%	28,297,663	**20.47%**
397.03	COMMUNICATION EQUIPMENT - RADIO SYSTEMS	82,080,515	SQ	7	0%	82,080,515	43,031,076	39,049,439	3.12	12,515,846	15.25%	0	0.00%	12,515,846	**15.25%**
397.04	COMMUNICATION EQUIPMENT - VOICE SYSTEMS	27,046,808	SQ	7	0%	27,046,808	13,212,737	13,834,071	3.50	3,952,592	14.61%	0	0.00%	3,952,592	**14.61%**
397.05	COMMUNICATION EQUIPMENT - TRANSMISSION SYSTEMS	429,432,879	SQ	20	0%	429,432,879	167,184,882	262,247,997	12.74	20,584,615	4.79%	0	0.00%	20,584,615	**4.79%**
397.06	COMMUNICATION EQUIPMENT - TRANSMISSION SYSTEMS, GAS AMI	329,771,154	SQ	20	0%	329,771,154	124,154,031	205,617,123	12.12	16,965,109	5.14%	0	0.00%	16,965,109	**5.14%**
397.07	COMMUNICATION EQUIPMENT - TRANSMISSION SYSTEMS, ELECTRIC AMI	117,075	SQ	20	0%	117,075	98,061	19,014	19.50	975	0.83%	0	0.00%	975	**0.83%**
397.08	AMI COMMUNICATION NETWORK	120,857,576	SQ	20	0%	120,857,576	48,936,700	71,920,877	12.22	5,885,505	4.87%	0	0.00%	5,885,505	**4.87%**
398.00	MISCELLANEOUS EQUIPMENT	37,731,921	SQ	20	0%	37,731,921	3,762,004	33,969,917	16.79	2,023,223	5.36%	0	0.00%	2,023,223	**5.36%**
399.00	OTHER TANGIBLE PROPERTY	679	SQ	20	0%	679	652	27	18.50	1	0.22%	0	0.00%	1	**0.22%**
	TOTAL COMMON DIVISION STUDIED	6,243,975,518			-0.2%	6,253,794,705	2,452,548,869	3,801,245,836	8.82	448,238,613	7.18%	-17,224,258	-0.28%	431,014,355	**6.90%**
	TOTAL DEPRECIABLE PLANT STUDIED	**52,075,465,588**			**-49.2%**	**77,691,560,439**	**23,358,029,980**	**54,333,530,460**	**28.05**	**1,282,292,945**	**2.46%**	**654,525,144**	**1.26%**	**1,936,818,089**	**3.72%**

[1] Company depreciation study
[2] Average life and Iowa curve shape developed through actuarial analysis and professional judgment
[3] Net salvage for mass property accounts developed through statistical analysis and professional judgment
[4] = [1]*(1-[3])
[5] Company depreciation study
[6] = [4] - [5]
[7] Composite remaining life based on Iowa cuve in [2]; see remaining life exhibit for detailed calculations
[8] = ([1] - [5]) / [7]
[9] = [8] / [1]
[10] = [12] - [8]
[11] = [13] - [9]
[12] = [6] / [7]
[13] = [12] / [1]

Account 353.02 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] PG&E R1.5-55	[5] TURN R1.5-61	[6] PG&E SSD	[7] TURN SSD
0.0	94,791,835	100.00%	100.00%	100.00%	0.0000	0.0000
0.5	99,322,915	99.93%	99.84%	99.86%	0.0000	0.0000
1.5	78,062,394	99.67%	99.51%	99.56%	0.0000	0.0000
2.5	56,459,931	99.61%	99.17%	99.25%	0.0000	0.0000
3.5	57,317,510	99.51%	98.82%	98.94%	0.0000	0.0000
4.5	59,970,432	99.41%	98.45%	98.61%	0.0001	0.0001
5.5	56,744,284	99.28%	98.07%	98.28%	0.0001	0.0001
6.5	58,431,468	99.28%	97.68%	97.93%	0.0003	0.0002
7.5	58,951,547	99.27%	97.28%	97.58%	0.0004	0.0003
8.5	55,746,067	98.69%	96.86%	97.21%	0.0003	0.0002
9.5	63,254,139	98.34%	96.43%	96.84%	0.0004	0.0002
10.5	59,928,539	98.30%	95.99%	96.45%	0.0005	0.0003
11.5	58,530,993	98.30%	95.53%	96.05%	0.0008	0.0005
12.5	64,530,737	98.25%	95.06%	95.64%	0.0010	0.0007
13.5	49,225,536	98.25%	94.57%	95.21%	0.0014	0.0009
14.5	84,513,935	98.24%	94.07%	94.78%	0.0017	0.0012
15.5	84,196,841	98.20%	93.55%	94.33%	0.0022	0.0015
16.5	84,191,730	98.09%	93.01%	93.87%	0.0026	0.0018
17.5	83,826,705	96.05%	92.46%	93.40%	0.0013	0.0007
18.5	85,372,145	94.34%	91.89%	92.91%	0.0006	0.0002
19.5	79,907,841	92.69%	91.30%	92.41%	0.0002	0.0000
20.5	78,411,047	92.04%	90.70%	91.90%	0.0002	0.0000
21.5	77,180,412	91.83%	90.08%	91.37%	0.0003	0.0000
22.5	76,124,201	91.53%	89.43%	90.83%	0.0004	0.0000
23.5	77,512,227	91.52%	88.77%	90.27%	0.0008	0.0002
24.5	70,712,191	91.46%	88.09%	89.70%	0.0011	0.0003
25.5	66,526,066	90.30%	87.38%	89.11%	0.0009	0.0001
26.5	71,275,015	90.30%	86.65%	88.50%	0.0013	0.0003
27.5	64,493,522	90.29%	85.90%	87.88%	0.0019	0.0006
28.5	64,106,431	90.28%	85.12%	87.24%	0.0027	0.0009
29.5	62,346,067	90.27%	84.31%	86.58%	0.0035	0.0014
30.5	61,067,095	90.25%	83.48%	85.90%	0.0046	0.0019
31.5	52,033,582	90.25%	82.63%	85.20%	0.0058	0.0026
32.5	49,852,536	90.23%	81.75%	84.47%	0.0072	0.0033
33.5	13,223,991	90.22%	80.83%	83.73%	0.0088	0.0042
34.5	10,511,041	90.22%	79.89%	82.97%	0.0107	0.0053
35.5	10,501,153	90.18%	78.92%	82.18%	0.0127	0.0064
36.5	8,742,759	90.18%	77.91%	81.37%	0.0150	0.0078
37.5	9,334,855	90.11%	76.88%	80.54%	0.0175	0.0092
38.5	7,752,919	90.09%	75.81%	79.69%	0.0204	0.0108
39.5	7,317,613	89.30%	74.71%	78.80%	0.0213	0.0110
40.5	11,244,829	89.18%	73.58%	77.90%	0.0243	0.0127
41.5	11,370,545	88.84%	72.42%	76.97%	0.0270	0.0141
42.5	11,809,861	88.31%	71.22%	76.01%	0.0292	0.0151
43.5	12,615,061	88.25%	69.98%	75.02%	0.0334	0.0175
44.5	18,086,659	88.19%	68.72%	74.01%	0.0379	0.0201
45.5	14,123,896	87.03%	67.42%	72.97%	0.0385	0.0198
46.5	12,416,501	86.95%	66.08%	71.91%	0.0436	0.0226
47.5	15,728,655	86.95%	64.71%	70.82%	0.0495	0.0260
48.5	11,022,559	80.94%	63.31%	69.70%	0.0311	0.0126
49.5	12,318,249	80.59%	61.88%	68.55%	0.0350	0.0145
50.5	13,165,977	80.58%	60.41%	67.37%	0.0407	0.0174
51.5	13,036,225	80.19%	58.92%	66.17%	0.0453	0.0197
52.5	11,024,401	78.70%	57.39%	64.94%	0.0454	0.0189
53.5	10,918,471	78.29%	55.84%	63.68%	0.0504	0.0213
54.5	10,870,560	77.64%	54.26%	62.40%	0.0547	0.0232
55.5	10,675,529	77.58%	52.66%	61.09%	0.0621	0.0272
56.5	10,620,430	77.17%	51.03%	59.75%	0.0683	0.0303
57.5	10,130,361	73.52%	49.38%	58.39%	0.0583	0.0229
58.5	9,659,429	70.81%	47.72%	57.01%	0.0533	0.0190
59.5	6,743,329	70.81%	46.04%	55.61%	0.0613	0.0231
60.5	6,300,338	68.87%	44.35%	54.18%	0.0601	0.0216

Account 353.02 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] PG&E R1.5-55	[5] TURN R1.5-61	[6] PG&E SSD	[7] TURN SSD
61.5	5,724,514	68.28%	42.66%	52.73%	0.0657	0.0242
62.5	4,758,209	68.28%	40.95%	51.27%	0.0747	0.0289
63.5	4,457,576	68.26%	39.25%	49.79%	0.0842	0.0341
64.5	4,311,112	68.26%	37.55%	48.29%	0.0943	0.0399
65.5	4,312,887	68.26%	35.85%	46.79%	0.1050	0.0461
66.5	4,282,848	68.26%	34.17%	45.27%	0.1162	0.0529
67.5	3,508,550	68.26%	32.49%	43.74%	0.1279	0.0601
68.5	2,794,063	68.19%	30.84%	42.21%	0.1395	0.0675
69.5	2,431,928	68.17%	29.21%	40.67%	0.1518	0.0756
70.5	2,601,810	68.17%	27.60%	39.14%	0.1646	0.0843
71.5	2,542,819	63.47%	26.03%	37.60%	0.1402	0.0669
72.5	2,566,958	63.47%	24.48%	36.07%	0.1520	0.0751
73.5	1,534,247	63.47%	22.98%	34.55%	0.1640	0.0836
74.5	1,825,302	63.47%	21.51%	33.04%	0.1761	0.0926
75.5	1,626,195	55.54%	20.08%	31.54%	0.1257	0.0576
76.5	1,609,778	55.54%	18.70%	30.06%	0.1357	0.0649
77.5	1,779,866	55.54%	17.36%	28.60%	0.1457	0.0726
78.5	1,773,054	55.54%	16.08%	27.16%	0.1557	0.0805
79.5	1,862,797	55.49%	14.84%	25.75%	0.1652	0.0885
80.5	1,860,773	55.49%	13.66%	24.36%	0.1750	0.0969
81.5	1,859,923	55.49%	12.52%	23.00%	0.1846	0.1056
82.5	1,834,068	54.97%	11.44%	21.67%	0.1895	0.1109
83.5	1,807,900	54.97%	10.42%	20.38%	0.1985	0.1196
84.5	1,776,854	54.55%	9.44%	19.13%	0.2034	0.1255
85.5	1,763,278	54.55%	8.52%	17.91%	0.2118	0.1343
86.5	1,104,777	54.55%	7.66%	16.73%	0.2199	0.1431
87.5	1,054,384	54.37%	6.84%	15.59%	0.2259	0.1504
88.5	862,503	54.37%	6.08%	14.49%	0.2331	0.1591
89.5	674,696	54.37%	5.38%	13.43%	0.2400	0.1676
90.5	529,005	54.37%	4.72%	12.42%	0.2465	0.1760
91.5	517,529	54.37%	4.12%	11.44%	0.2525	0.1843
92.5	496,049	54.37%	3.57%	10.52%	0.2581	0.1923
93.5	401,834	54.37%	3.07%	9.63%	0.2632	0.2002
94.5	357,481	54.15%	2.62%	8.79%	0.2655	0.2058
95.5	344,984	54.15%	2.22%	7.99%	0.2697	0.2130
96.5	92,196	54.15%	1.86%	7.24%	0.2734	0.2201
97.5	92,196	54.15%	1.55%	6.53%	0.2767	0.2268
98.5	0	54.15%	1.28%	5.86%		
Sum of Squared Differences				[8]	7.7718	4.6222
Up to 1% of Beginning Exposures				[9]	5.1931	2.6771

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

Account 355 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] PG&E R1.5-54	[5] TURN R1.5-58	[6] PG&E SSD	[7] TURN SSD
0.0	1,003,062,719	100.00%	100.00%	100.00%	0.0000	0.0000
0.5	861,159,630	100.00%	99.84%	99.85%	0.0000	0.0000
1.5	760,059,654	99.77%	99.50%	99.54%	0.0000	0.0000
2.5	687,882,906	99.31%	99.15%	99.21%	0.0000	0.0000
3.5	634,368,790	99.19%	98.79%	98.88%	0.0000	0.0000
4.5	548,774,189	99.02%	98.42%	98.54%	0.0000	0.0000
5.5	458,873,521	98.59%	98.04%	98.18%	0.0000	0.0000
6.5	417,695,326	98.47%	97.64%	97.82%	0.0001	0.0000
7.5	364,353,179	98.25%	97.22%	97.44%	0.0001	0.0001
8.5	317,395,170	97.91%	96.80%	97.05%	0.0001	0.0001
9.5	300,896,828	97.65%	96.36%	96.65%	0.0002	0.0001
10.5	274,537,388	97.32%	95.90%	96.23%	0.0002	0.0001
11.5	239,807,702	97.05%	95.43%	95.81%	0.0003	0.0002
12.5	226,683,015	96.74%	94.95%	95.36%	0.0003	0.0002
13.5	213,398,587	96.37%	94.44%	94.91%	0.0004	0.0002
14.5	195,669,206	96.06%	93.93%	94.44%	0.0005	0.0003
15.5	186,224,179	95.77%	93.39%	93.96%	0.0006	0.0003
16.5	175,406,042	95.45%	92.84%	93.47%	0.0007	0.0004
17.5	160,694,013	94.98%	92.28%	92.96%	0.0007	0.0004
18.5	148,895,937	94.52%	91.69%	92.44%	0.0008	0.0004
19.5	135,187,237	94.06%	91.09%	91.90%	0.0009	0.0005
20.5	124,396,261	93.44%	90.47%	91.34%	0.0009	0.0004
21.5	120,188,801	92.81%	89.82%	90.77%	0.0009	0.0004
22.5	113,000,893	92.16%	89.16%	90.18%	0.0009	0.0004
23.5	107,202,460	91.05%	88.47%	89.57%	0.0007	0.0002
24.5	102,807,059	90.53%	87.77%	88.95%	0.0008	0.0002
25.5	96,078,513	89.73%	87.04%	88.31%	0.0007	0.0002
26.5	88,583,047	89.02%	86.28%	87.64%	0.0007	0.0002
27.5	84,124,603	88.35%	85.50%	86.96%	0.0008	0.0002
28.5	72,010,930	87.53%	84.70%	86.26%	0.0008	0.0002
29.5	68,906,764	86.96%	83.86%	85.53%	0.0010	0.0002
30.5	63,835,305	86.01%	83.00%	84.78%	0.0009	0.0002
31.5	57,030,913	85.45%	82.12%	84.01%	0.0011	0.0002
32.5	50,052,143	84.83%	81.20%	83.22%	0.0013	0.0003
33.5	47,393,580	83.90%	80.25%	82.40%	0.0013	0.0002
34.5	45,106,511	82.86%	79.27%	81.55%	0.0013	0.0002
35.5	43,584,537	81.32%	78.26%	80.68%	0.0009	0.0000
36.5	40,894,337	80.46%	77.22%	79.78%	0.0011	0.0000
37.5	38,709,884	79.57%	76.14%	78.86%	0.0012	0.0001
38.5	37,148,337	78.83%	75.03%	77.91%	0.0014	0.0001
39.5	34,925,190	77.96%	73.89%	76.93%	0.0017	0.0001
40.5	32,879,840	76.92%	72.71%	75.92%	0.0018	0.0001
41.5	31,740,548	76.05%	71.50%	74.88%	0.0021	0.0001
42.5	29,300,985	74.52%	70.25%	73.81%	0.0018	0.0001
43.5	27,606,650	73.31%	68.97%	72.71%	0.0019	0.0000
44.5	24,907,486	72.06%	67.65%	71.58%	0.0019	0.0000
45.5	22,980,622	70.36%	66.29%	70.42%	0.0017	0.0000
46.5	21,289,458	69.00%	64.91%	69.23%	0.0017	0.0000
47.5	19,609,893	67.55%	63.48%	68.01%	0.0017	0.0000
48.5	17,455,709	65.86%	62.03%	66.76%	0.0015	0.0001
49.5	15,937,620	64.55%	60.54%	65.48%	0.0016	0.0001
50.5	15,002,722	63.26%	59.01%	64.17%	0.0018	0.0001
51.5	12,817,957	62.24%	57.46%	62.83%	0.0023	0.0000
52.5	11,465,719	60.59%	55.88%	61.46%	0.0022	0.0001
53.5	10,240,819	58.94%	54.27%	60.07%	0.0022	0.0001
54.5	9,048,960	56.72%	52.64%	58.64%	0.0017	0.0004
55.5	8,250,908	55.72%	50.98%	57.19%	0.0022	0.0002
56.5	7,170,746	53.95%	49.31%	55.72%	0.0022	0.0003
57.5	6,551,572	52.24%	47.61%	54.22%	0.0021	0.0004
58.5	6,125,644	51.39%	45.90%	52.70%	0.0030	0.0002
59.5	5,521,583	49.96%	44.18%	51.16%	0.0033	0.0001
60.5	4,589,728	48.10%	42.45%	49.60%	0.0032	0.0002

Account 355 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] PG&E R1.5-54	[5] TURN R1.5-58	[6] PG&E SSD	[7] TURN SSD
61.5	3,850,609	46.82%	40.72%	48.02%	0.0037	0.0001
62.5	3,344,151	45.89%	38.98%	46.43%	0.0048	0.0000
63.5	2,624,915	45.03%	37.25%	44.83%	0.0061	0.0000
64.5	1,980,908	43.70%	35.52%	43.23%	0.0067	0.0000
65.5	1,413,609	42.52%	33.81%	41.61%	0.0076	0.0001
66.5	1,199,701	41.02%	32.11%	40.00%	0.0079	0.0001
67.5	1,107,996	40.85%	30.43%	38.38%	0.0109	0.0006
68.5	937,816	40.11%	28.78%	36.77%	0.0128	0.0011
69.5	493,859	39.62%	27.15%	35.17%	0.0156	0.0020
70.5	497,428	37.58%	25.55%	33.57%	0.0145	0.0016
71.5	583,158	36.71%	23.99%	31.99%	0.0162	0.0022
72.5	590,438	35.34%	22.47%	30.43%	0.0166	0.0024
73.5	640,478	34.35%	20.99%	28.89%	0.0179	0.0030
74.5	553,864	32.44%	19.55%	27.37%	0.0166	0.0026
75.5	601,938	30.84%	18.16%	25.88%	0.0161	0.0025
76.5	594,262	27.89%	16.82%	24.42%	0.0122	0.0012
77.5	583,336	26.85%	15.54%	22.99%	0.0128	0.0015
78.5	646,830	26.36%	14.30%	21.60%	0.0145	0.0023
79.5	602,120	24.33%	13.12%	20.24%	0.0126	0.0017
80.5	582,964	23.61%	11.99%	18.92%	0.0135	0.0022
81.5	560,785	22.72%	10.91%	17.65%	0.0139	0.0026
82.5	541,424	21.98%	9.90%	16.42%	0.0146	0.0031
83.5	527,458	21.44%	8.94%	15.23%	0.0156	0.0039
84.5	506,407	20.63%	8.03%	14.09%	0.0159	0.0043
85.5	493,330	20.12%	7.18%	13.00%	0.0167	0.0051
86.5	476,980	19.52%	6.38%	11.95%	0.0173	0.0057
87.5	449,711	18.43%	5.64%	10.95%	0.0164	0.0056
88.5	390,638	16.33%	4.95%	10.00%	0.0129	0.0040
89.5	348,747	14.72%	4.32%	9.10%	0.0108	0.0032
90.5	263,378	11.89%	3.74%	8.24%	0.0066	0.0013
91.5	218,937	10.17%	3.22%	7.44%	0.0048	0.0007
92.5	156,269	7.86%	2.74%	6.68%	0.0026	0.0001
93.5	153,653	7.73%	2.32%	5.97%	0.0029	0.0003
94.5	76,721	4.83%	1.95%	5.30%	0.0008	0.0000
95.5	39,328	3.42%	1.62%	4.69%	0.0003	0.0002
96.5	33,847	3.17%	1.34%	4.12%	0.0003	0.0001
97.5	513	2.06%	1.09%	3.59%	0.0001	0.0002
98.5	0	2.06%	0.88%	3.12%		
Sum of Squared Differences				[8]	0.4622	0.0776
Up to 1% of Beginning Exposures				[9]	0.0522	0.0082

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

Account 362 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] PG&E R1.5-46	[5] TURN R1.5-52	[6] PG&E SSD	[7] TURN SSD
0.0	2,618,783,067	100.00%	100.00%	100.00%	0.0000	0.0000
0.5	2,552,231,048	99.96%	99.81%	99.83%	0.0000	0.0000
1.5	2,468,182,323	99.74%	99.41%	99.48%	0.0000	0.0000
2.5	2,276,022,970	99.47%	99.00%	99.12%	0.0000	0.0000
3.5	2,136,782,727	99.12%	98.57%	98.74%	0.0000	0.0000
4.5	2,015,427,521	98.90%	98.12%	98.35%	0.0001	0.0000
5.5	1,768,131,020	98.66%	97.65%	97.95%	0.0001	0.0001
6.5	1,600,857,807	98.36%	97.17%	97.53%	0.0001	0.0001
7.5	1,489,405,435	98.14%	96.66%	97.10%	0.0002	0.0001
8.5	1,334,324,651	97.91%	96.14%	96.65%	0.0003	0.0002
9.5	1,226,223,721	97.60%	95.60%	96.19%	0.0004	0.0002
10.5	1,130,994,801	97.17%	95.03%	95.71%	0.0005	0.0002
11.5	1,054,431,165	96.84%	94.44%	95.22%	0.0006	0.0003
12.5	1,006,808,758	96.47%	93.84%	94.71%	0.0007	0.0003
13.5	968,593,210	96.09%	93.20%	94.18%	0.0008	0.0004
14.5	916,967,741	95.74%	92.55%	93.63%	0.0010	0.0004
15.5	863,945,833	95.38%	91.87%	93.07%	0.0012	0.0005
16.5	794,426,265	94.96%	91.17%	92.49%	0.0014	0.0006
17.5	725,198,159	94.47%	90.44%	91.88%	0.0016	0.0007
18.5	655,807,839	93.73%	89.68%	91.26%	0.0016	0.0006
19.5	556,906,104	93.26%	88.89%	90.62%	0.0019	0.0007
20.5	453,363,348	92.30%	88.08%	89.96%	0.0018	0.0005
21.5	446,908,290	91.67%	87.23%	89.28%	0.0020	0.0006
22.5	435,660,161	90.96%	86.35%	88.57%	0.0021	0.0006
23.5	415,604,821	90.07%	85.43%	87.84%	0.0021	0.0005
24.5	399,939,693	89.21%	84.48%	87.08%	0.0022	0.0005
25.5	372,243,294	88.17%	83.49%	86.30%	0.0022	0.0004
26.5	336,588,443	86.98%	82.47%	85.49%	0.0020	0.0002
27.5	311,990,135	85.62%	81.40%	84.65%	0.0018	0.0001
28.5	274,916,818	84.81%	80.29%	83.78%	0.0020	0.0001
29.5	264,133,688	83.23%	79.14%	82.89%	0.0017	0.0000
30.5	249,579,069	82.48%	77.95%	81.96%	0.0021	0.0000
31.5	224,935,391	81.41%	76.71%	81.00%	0.0022	0.0000
32.5	207,196,834	80.23%	75.42%	80.01%	0.0023	0.0000
33.5	204,799,654	79.03%	74.09%	78.98%	0.0024	0.0000
34.5	208,750,190	77.99%	72.71%	77.92%	0.0028	0.0000
35.5	207,490,083	76.63%	71.28%	76.83%	0.0029	0.0000
36.5	198,945,189	75.35%	69.81%	75.70%	0.0031	0.0000
37.5	187,378,027	73.81%	68.28%	74.53%	0.0031	0.0001
38.5	179,028,008	72.53%	66.71%	73.33%	0.0034	0.0001
39.5	171,749,505	71.55%	65.09%	72.09%	0.0042	0.0000
40.5	160,347,302	70.59%	63.42%	70.81%	0.0051	0.0000
41.5	145,718,090	69.50%	61.70%	69.49%	0.0061	0.0000
42.5	125,662,451	68.49%	59.94%	68.13%	0.0073	0.0000
43.5	113,571,901	67.56%	58.14%	66.74%	0.0089	0.0001
44.5	106,772,351	65.66%	56.30%	65.31%	0.0088	0.0000
45.5	102,537,756	64.26%	54.41%	63.84%	0.0097	0.0000
46.5	93,274,870	62.35%	52.50%	62.34%	0.0097	0.0000
47.5	91,588,848	60.80%	50.55%	60.80%	0.0105	0.0000
48.5	83,987,618	58.91%	48.57%	59.22%	0.0107	0.0000
49.5	77,454,312	57.56%	46.57%	57.61%	0.0121	0.0000
50.5	74,929,318	56.18%	44.56%	55.97%	0.0135	0.0000
51.5	69,991,040	55.27%	42.53%	54.31%	0.0162	0.0001
52.5	63,358,629	53.91%	40.49%	52.61%	0.0180	0.0002
53.5	55,300,672	52.34%	38.45%	50.89%	0.0193	0.0002
54.5	51,478,227	51.41%	36.42%	49.14%	0.0225	0.0005
55.5	47,846,328	50.32%	34.40%	47.38%	0.0253	0.0009
56.5	43,910,571	49.21%	32.40%	45.60%	0.0282	0.0013
57.5	40,279,469	47.63%	30.43%	43.81%	0.0296	0.0015
58.5	38,224,338	46.17%	28.49%	42.02%	0.0313	0.0017
59.5	36,433,338	45.21%	26.59%	40.21%	0.0347	0.0025
60.5	32,127,519	43.31%	24.73%	38.41%	0.0345	0.0024

Account 362 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] PG&E R1.5-46	[5] TURN R1.5-52	[6] PG&E SSD	[7] TURN SSD
61.5	29,287,234	42.49%	22.93%	36.62%	0.0383	0.0034
62.5	25,485,136	40.53%	21.18%	34.83%	0.0374	0.0033
63.5	19,699,738	37.46%	19.49%	33.05%	0.0323	0.0019
64.5	15,011,361	36.29%	17.87%	31.30%	0.0339	0.0025
65.5	11,849,786	35.07%	16.31%	29.57%	0.0352	0.0030
66.5	8,917,557	33.91%	14.83%	27.86%	0.0364	0.0037
67.5	7,491,665	32.84%	13.42%	26.19%	0.0377	0.0044
68.5	6,633,376	32.46%	12.08%	24.56%	0.0415	0.0062
69.5	5,662,568	31.48%	10.82%	22.96%	0.0427	0.0073
70.5	5,629,591	30.64%	9.64%	21.41%	0.0441	0.0085
71.5	5,749,767	30.34%	8.53%	19.91%	0.0475	0.0109
72.5	6,200,328	29.13%	7.50%	18.45%	0.0468	0.0114
73.5	6,013,861	27.66%	6.55%	17.05%	0.0446	0.0113
74.5	5,807,183	26.90%	5.67%	15.71%	0.0451	0.0125
75.5	5,514,562	26.60%	4.87%	14.41%	0.0472	0.0148
76.5	5,266,669	26.08%	4.14%	13.18%	0.0481	0.0166
77.5	4,645,075	24.13%	3.49%	12.01%	0.0426	0.0147
78.5	4,062,254	23.48%	2.90%	10.89%	0.0423	0.0158
79.5	3,858,983	23.11%	2.39%	9.84%	0.0429	0.0176
80.5	3,733,616	22.89%	1.95%	8.85%	0.0439	0.0197
81.5	3,592,152	22.57%	1.57%	7.91%	0.0441	0.0215
82.5	3,469,246	22.32%	1.25%	7.04%	0.0444	0.0234
83.5	3,295,046	21.70%	0.98%	6.22%	0.0429	0.0240
84.5	3,077,658	21.24%	0.76%	5.46%	0.0419	0.0249
85.5	2,813,120	20.53%	0.58%	4.77%	0.0398	0.0248
86.5	2,257,809	19.65%	0.42%	4.13%	0.0370	0.0241
87.5	1,712,622	17.88%	0.29%	3.55%	0.0309	0.0205
88.5	1,342,099	16.29%	0.19%	3.02%	0.0259	0.0176
89.5	1,139,879	14.96%	0.10%	2.55%	0.0221	0.0154
90.5	876,219	14.66%	0.04%	2.13%	0.0214	0.0157
91.5	341,121	14.33%	0.01%	1.77%	0.0205	0.0158
92.5	158,429	13.94%	0.00%	1.46%	0.0194	0.0156
93.5	83,449	13.53%	0.00%	1.19%	0.0183	0.0152
94.5	64,421	13.51%	0.00%	0.96%	0.0183	0.0158
95.5	43,099	12.28%	0.00%	0.76%	0.0151	0.0133
96.5	39,587	12.26%	0.00%	0.60%	0.0150	0.0136
97.5	38,763	12.00%	0.00%	0.46%	0.0144	0.0133
98.5	0	11.92%	0.00%	0.34%		
Sum of Squared Differences				[8]	1.7251	0.5245
Up to 1% of Beginning Exposures				[9]	0.4613	0.0238

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

Account 364 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] PG&E R2-44	[5] TURN R2-51	[6] PG&E SSD	[7] TURN SSD
0.0	3,054,250,674	100.00%	100.00%	100.00%	0.0000	0.0000
0.5	2,733,904,880	99.98%	99.89%	99.91%	0.0000	0.0000
1.5	2,646,722,680	99.87%	99.66%	99.71%	0.0000	0.0000
2.5	2,467,014,754	99.79%	99.42%	99.50%	0.0000	0.0000
3.5	2,300,368,253	99.66%	99.15%	99.28%	0.0000	0.0000
4.5	2,098,685,779	99.58%	98.86%	99.04%	0.0001	0.0000
5.5	1,958,123,875	99.47%	98.56%	98.79%	0.0001	0.0000
6.5	1,825,398,591	99.32%	98.23%	98.52%	0.0001	0.0001
7.5	1,747,631,656	99.16%	97.87%	98.24%	0.0002	0.0001
8.5	1,682,830,310	98.96%	97.49%	97.93%	0.0002	0.0001
9.5	1,603,133,145	98.76%	97.09%	97.61%	0.0003	0.0001
10.5	1,558,752,021	98.54%	96.65%	97.27%	0.0004	0.0002
11.5	1,504,801,512	98.28%	96.19%	96.91%	0.0004	0.0002
12.5	1,479,836,444	98.01%	95.69%	96.52%	0.0005	0.0002
13.5	1,436,181,654	97.71%	95.17%	96.12%	0.0006	0.0003
14.5	1,357,910,885	97.37%	94.61%	95.69%	0.0008	0.0003
15.5	1,292,894,468	97.05%	94.01%	95.24%	0.0009	0.0003
16.5	1,229,970,187	96.71%	93.37%	94.76%	0.0011	0.0004
17.5	1,185,185,134	96.36%	92.70%	94.25%	0.0013	0.0004
18.5	1,139,569,251	95.97%	91.98%	93.72%	0.0016	0.0005
19.5	1,065,399,025	95.55%	91.22%	93.16%	0.0019	0.0006
20.5	960,841,824	95.10%	90.42%	92.57%	0.0022	0.0006
21.5	878,340,237	94.63%	89.57%	91.95%	0.0026	0.0007
22.5	832,534,648	94.15%	88.67%	91.29%	0.0030	0.0008
23.5	796,346,102	93.62%	87.72%	90.61%	0.0035	0.0009
24.5	744,761,053	93.10%	86.71%	89.88%	0.0041	0.0010
25.5	687,183,834	92.57%	85.65%	89.13%	0.0048	0.0012
26.5	611,257,787	91.96%	84.53%	88.33%	0.0055	0.0013
27.5	557,820,738	91.41%	83.35%	87.50%	0.0065	0.0015
28.5	518,567,921	90.86%	82.11%	86.62%	0.0077	0.0018
29.5	475,907,796	90.16%	80.81%	85.70%	0.0087	0.0020
30.5	434,108,620	89.45%	79.43%	84.74%	0.0100	0.0022
31.5	384,718,056	88.75%	78.00%	83.74%	0.0116	0.0025
32.5	348,965,578	88.05%	76.49%	82.69%	0.0134	0.0029
33.5	322,873,727	87.16%	74.91%	81.59%	0.0150	0.0031
34.5	302,188,614	86.33%	73.26%	80.45%	0.0171	0.0035
35.5	281,683,544	85.33%	71.53%	79.25%	0.0190	0.0037
36.5	255,041,126	84.18%	69.73%	78.01%	0.0209	0.0038
37.5	227,395,531	82.97%	67.86%	76.71%	0.0228	0.0039
38.5	204,690,364	81.80%	65.92%	75.36%	0.0252	0.0041
39.5	184,117,652	80.79%	63.90%	73.96%	0.0285	0.0047
40.5	165,791,796	79.59%	61.82%	72.50%	0.0316	0.0050
41.5	148,617,112	77.75%	59.67%	70.99%	0.0327	0.0046
42.5	132,968,015	75.38%	57.45%	69.43%	0.0321	0.0035
43.5	120,972,187	73.10%	55.18%	67.81%	0.0321	0.0028
44.5	106,473,291	70.95%	52.85%	66.13%	0.0327	0.0023
45.5	96,499,499	69.29%	50.48%	64.40%	0.0354	0.0024
46.5	88,505,378	67.83%	48.06%	62.63%	0.0391	0.0027

Account 364 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] PG&E R2-44	[5] TURN R2-51	[6] PG&E SSD	[7] TURN SSD
47.5	82,258,786	66.47%	45.62%	60.80%	0.0435	0.0032
48.5	74,894,304	65.09%	43.15%	58.92%	0.0481	0.0038
49.5	65,479,071	63.71%	40.66%	56.99%	0.0531	0.0045
50.5	57,206,308	62.01%	38.18%	55.02%	0.0568	0.0049
51.5	46,031,358	59.96%	35.70%	53.02%	0.0589	0.0048
52.5	39,334,881	57.26%	33.24%	50.97%	0.0577	0.0040
53.5	32,145,407	53.40%	30.82%	48.90%	0.0510	0.0020
54.5	25,817,430	49.68%	28.44%	46.80%	0.0451	0.0008
55.5	20,831,725	47.42%	26.11%	44.68%	0.0454	0.0008
56.5	17,065,048	45.97%	23.86%	42.54%	0.0489	0.0012
57.5	14,127,307	44.87%	21.68%	40.40%	0.0538	0.0020
58.5	11,159,992	43.86%	19.58%	38.25%	0.0589	0.0031
59.5	8,544,504	42.89%	17.59%	36.11%	0.0640	0.0046
60.5	5,179,140	41.98%	15.70%	33.99%	0.0691	0.0064
61.5	3,581,118	41.16%	13.92%	31.88%	0.0742	0.0086
62.5	1,885,970	39.96%	12.25%	29.81%	0.0768	0.0103
63.5	522,545	38.63%	10.70%	27.77%	0.0780	0.0118
64.5	32,773	36.16%	9.26%	25.78%	0.0723	0.0108
65.5	3,970	4.38%	7.95%	23.83%		
Sum of Squared Differences				[8]	1.5340	0.1611
Up to 1% of Beginning Exposures				[9]	0.8474	0.1007

[1] Age in years using half-year convention

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

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

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

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

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

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

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

Account 365 Curve Fitting

[1]	[2]	[3]	[4]	[5]	[6]	[7]
Age (Years)	**Exposures (Dollars)**	**Observed Life Table (OLT)**	**PG&E R2-46**	**TURN R2-52**	**PG&E SSD**	**TURN SSD**
0.0	3,282,694,119	100.00%	100.00%	100.00%	0.0000	0.0000
0.5	3,184,528,564	99.99%	99.90%	99.91%	0.0000	0.0000
1.5	3,125,247,279	99.86%	99.68%	99.72%	0.0000	0.0000
2.5	3,003,677,189	99.69%	99.44%	99.51%	0.0000	0.0000
3.5	2,878,658,042	99.54%	99.19%	99.30%	0.0000	0.0000
4.5	2,643,833,847	99.45%	98.92%	99.06%	0.0000	0.0000
5.5	2,407,746,806	99.33%	98.63%	98.82%	0.0000	0.0000
6.5	2,174,557,282	99.18%	98.32%	98.56%	0.0001	0.0000
7.5	2,029,272,145	99.04%	97.99%	98.28%	0.0001	0.0001
8.5	1,928,917,867	98.87%	97.64%	97.98%	0.0002	0.0001
9.5	1,819,124,376	98.71%	97.26%	97.67%	0.0002	0.0001
10.5	1,754,856,739	98.54%	96.85%	97.34%	0.0003	0.0001
11.5	1,688,303,559	98.36%	96.42%	96.99%	0.0004	0.0002
12.5	1,671,472,865	98.17%	95.97%	96.62%	0.0005	0.0002
13.5	1,637,315,697	97.92%	95.48%	96.23%	0.0006	0.0003
14.5	1,552,813,431	97.66%	94.96%	95.81%	0.0007	0.0003
15.5	1,492,445,478	97.38%	94.42%	95.37%	0.0009	0.0004
16.5	1,420,928,598	97.09%	93.83%	94.91%	0.0011	0.0005
17.5	1,362,259,303	96.75%	93.22%	94.43%	0.0012	0.0005
18.5	1,301,613,235	96.40%	92.56%	93.91%	0.0015	0.0006
19.5	1,212,566,899	95.99%	91.87%	93.37%	0.0017	0.0007
20.5	1,088,725,143	95.52%	91.14%	92.81%	0.0019	0.0007
21.5	1,007,667,919	95.08%	90.37%	92.21%	0.0022	0.0008
22.5	922,101,986	94.61%	89.55%	91.58%	0.0026	0.0009
23.5	886,252,972	94.07%	88.69%	90.92%	0.0029	0.0010
24.5	843,132,799	93.52%	87.78%	90.23%	0.0033	0.0011
25.5	784,150,063	92.90%	86.82%	89.50%	0.0037	0.0012
26.5	707,918,909	92.18%	85.82%	88.74%	0.0041	0.0012
27.5	648,406,461	91.44%	84.76%	87.94%	0.0045	0.0012
28.5	591,166,355	90.71%	83.64%	87.11%	0.0050	0.0013
29.5	544,727,834	89.92%	82.47%	86.23%	0.0056	0.0014
30.5	497,786,121	89.00%	81.24%	85.31%	0.0060	0.0014
31.5	435,787,034	88.08%	79.95%	84.35%	0.0066	0.0014
32.5	395,015,688	87.22%	78.60%	83.35%	0.0074	0.0015
33.5	367,843,747	86.42%	77.18%	82.31%	0.0085	0.0017
34.5	346,280,604	85.49%	75.71%	81.21%	0.0096	0.0018
35.5	327,705,985	84.48%	74.16%	80.08%	0.0106	0.0019
36.5	304,634,455	83.41%	72.55%	78.89%	0.0118	0.0020
37.5	279,011,468	82.16%	70.87%	77.65%	0.0127	0.0020
38.5	256,133,288	80.83%	69.13%	76.37%	0.0137	0.0020
39.5	236,640,594	79.45%	67.32%	75.03%	0.0147	0.0020
40.5	215,343,672	77.80%	65.44%	73.64%	0.0153	0.0017
41.5	194,174,187	75.92%	63.50%	72.20%	0.0154	0.0014
42.5	169,704,279	73.65%	61.50%	70.71%	0.0148	0.0009
43.5	150,121,253	71.63%	59.43%	69.17%	0.0149	0.0006
44.5	134,848,213	69.95%	57.31%	67.57%	0.0160	0.0006
45.5	121,697,767	68.03%	55.13%	65.92%	0.0166	0.0004
46.5	109,781,504	65.57%	52.91%	64.22%	0.0160	0.0002
47.5	99,278,832	63.18%	50.64%	62.47%	0.0157	0.0001
48.5	90,623,280	61.67%	48.33%	60.67%	0.0178	0.0001
49.5	78,754,599	60.24%	45.99%	58.82%	0.0203	0.0002
50.5	70,803,259	58.86%	43.63%	56.94%	0.0232	0.0004
51.5	61,225,015	57.41%	41.26%	55.00%	0.0261	0.0006
52.5	55,502,129	56.01%	38.88%	53.04%	0.0293	0.0009
53.5	49,278,651	54.51%	36.51%	51.03%	0.0324	0.0012
54.5	43,242,599	52.67%	34.15%	49.00%	0.0343	0.0013
55.5	36,919,212	50.43%	31.82%	46.94%	0.0347	0.0012
56.5	31,558,373	48.56%	29.52%	44.86%	0.0363	0.0014
57.5	27,385,248	46.74%	27.27%	42.77%	0.0379	0.0016
58.5	23,083,104	44.67%	25.07%	40.66%	0.0384	0.0016
59.5	19,044,473	42.36%	22.95%	38.56%	0.0377	0.0014
60.5	14,438,476	40.11%	20.89%	36.46%	0.0369	0.0013

Account 365 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] PG&E R2-46	[5] TURN R2-52	[6] PG&E SSD	[7] TURN SSD
61.5	11,795,337	38.21%	18.92%	34.37%	0.0372	0.0015
62.5	9,072,071	35.85%	17.04%	32.31%	0.0354	0.0013
63.5	6,499,780	33.50%	15.26%	30.26%	0.0333	0.0010
64.5	4,177,565	30.55%	13.58%	28.26%	0.0288	0.0005
65.5	2,520,136	28.23%	12.01%	26.29%	0.0263	0.0004
66.5	983,356	25.00%	10.54%	24.37%	0.0209	0.0000
67.5	6,147	8.30%	9.17%	22.50%	0.0001	0.0202
68.5	7,326	8.09%	7.92%	20.70%	0.0000	0.0159
69.5	6,465	6.16%	6.77%	18.96%	0.0000	0.0164
70.5	9,171	6.13%	5.73%	17.29%	0.0000	0.0125
71.5	9,098	6.09%	4.78%	15.70%	0.0002	0.0092
72.5	7,463	4.99%	3.94%	14.18%	0.0001	0.0085
73.5	7,437	4.97%	3.19%	12.75%	0.0003	0.0061
74.5	7,231	4.84%	2.53%	11.40%	0.0005	0.0043
75.5	6,972	4.66%	1.95%	10.13%	0.0007	0.0030
76.5	5,941	3.97%	1.47%	8.95%	0.0006	0.0025
77.5	7,023	3.94%	1.06%	7.85%	0.0008	0.0015
78.5	6,939	3.90%	0.73%	6.83%	0.0010	0.0009
79.5	19,553	3.42%	0.47%	5.90%	0.0009	0.0006
80.5	19,523	3.41%	0.28%	5.04%	0.0010	0.0003
81.5	19,454	3.40%	0.15%	4.27%	0.0011	0.0001
82.5	19,255	3.36%	0.06%	3.56%	0.0011	0.0000
83.5	18,986	3.32%	0.02%	2.94%	0.0011	0.0000
84.5	18,247	3.19%	0.00%	2.38%	0.0010	0.0001
85.5	17,706	3.09%	0.00%	1.89%	0.0010	0.0001
86.5	16,718	2.92%	0.00%	1.46%	0.0009	0.0002
87.5	16,118	2.82%	0.00%	1.10%	0.0008	0.0003
88.5	15,696	2.74%	0.00%	0.80%	0.0008	0.0004
89.5	14,573	2.55%	0.00%	0.55%	0.0007	0.0004
90.5	14,532	2.54%	0.00%	0.36%	0.0006	0.0005
91.5	14,141	2.47%	0.00%	0.21%	0.0006	0.0005
92.5	13,660	2.39%	0.00%	0.11%	0.0006	0.0005
93.5	12,171	2.13%	0.00%	0.05%	0.0005	0.0004
94.5	11,080	1.94%	0.00%	0.02%	0.0004	0.0004
95.5	6,241	1.09%	0.00%	0.00%	0.0001	0.0001
96.5	5,601	0.98%	0.00%	0.00%	0.0001	0.0001
97.5	4,243	0.74%	0.00%	0.00%	0.0001	0.0001
98.5	0	0.00%	0.00%	0.00%		
Sum of Squared Differences				[8]	0.8762	0.1624
Up to 1% of Beginning Exposures				[9]	0.4897	0.0445

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

Account 366 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] PG&E R4-65	[5] TURN R4-70	[6] PG&E SSD	[7] TURN SSD
0.0	1,639,116,644	100.00%	100.00%	100.00%	0.0000	0.0000
0.5	1,675,824,311	100.00%	100.00%	100.00%	0.0000	0.0000
1.5	1,693,567,179	99.99%	100.00%	100.00%	0.0000	0.0000
2.5	1,674,182,502	99.98%	100.00%	100.00%	0.0000	0.0000
3.5	1,612,776,354	99.98%	99.99%	99.99%	0.0000	0.0000
4.5	1,587,280,651	99.97%	99.99%	99.99%	0.0000	0.0000
5.5	1,539,902,334	99.95%	99.99%	99.99%	0.0000	0.0000
6.5	1,515,676,618	99.94%	99.98%	99.98%	0.0000	0.0000
7.5	1,489,711,177	99.93%	99.98%	99.98%	0.0000	0.0000
8.5	1,506,385,372	99.91%	99.97%	99.98%	0.0000	0.0000
9.5	1,510,525,869	99.89%	99.96%	99.97%	0.0000	0.0000
10.5	1,470,469,228	99.87%	99.95%	99.96%	0.0000	0.0000
11.5	1,408,521,001	99.84%	99.94%	99.95%	0.0000	0.0000
12.5	1,360,979,154	99.81%	99.93%	99.94%	0.0000	0.0000
13.5	1,322,259,424	99.78%	99.91%	99.93%	0.0000	0.0000
14.5	1,260,929,128	99.75%	99.89%	99.91%	0.0000	0.0000
15.5	1,220,107,529	99.72%	99.87%	99.89%	0.0000	0.0000
16.5	1,167,456,109	99.69%	99.84%	99.87%	0.0000	0.0000
17.5	1,104,791,172	99.66%	99.81%	99.85%	0.0000	0.0000
18.5	1,020,301,560	99.62%	99.77%	99.82%	0.0000	0.0000
19.5	922,814,565	99.59%	99.73%	99.79%	0.0000	0.0000
20.5	837,206,377	99.55%	99.68%	99.75%	0.0000	0.0000
21.5	793,895,235	99.51%	99.62%	99.71%	0.0000	0.0000
22.5	776,359,684	99.45%	99.55%	99.66%	0.0000	0.0000
23.5	707,333,735	99.40%	99.47%	99.60%	0.0000	0.0000
24.5	678,435,746	99.34%	99.38%	99.53%	0.0000	0.0000
25.5	634,841,011	99.26%	99.28%	99.46%	0.0000	0.0000
26.5	574,159,341	99.18%	99.16%	99.37%	0.0000	0.0000
27.5	502,995,866	99.09%	99.03%	99.28%	0.0000	0.0000
28.5	435,208,450	98.98%	98.87%	99.17%	0.0000	0.0000
29.5	387,232,866	98.86%	98.70%	99.04%	0.0000	0.0000
30.5	346,144,924	98.75%	98.51%	98.90%	0.0000	0.0000
31.5	314,347,755	98.62%	98.29%	98.75%	0.0000	0.0000
32.5	289,985,659	98.48%	98.04%	98.57%	0.0000	0.0000
33.5	273,162,425	98.36%	97.76%	98.38%	0.0000	0.0000
34.5	260,912,910	98.27%	97.46%	98.16%	0.0001	0.0000
35.5	241,086,342	98.17%	97.11%	97.92%	0.0001	0.0000
36.5	210,162,120	98.09%	96.73%	97.65%	0.0002	0.0000
37.5	189,011,208	98.02%	96.31%	97.35%	0.0003	0.0000
38.5	170,134,226	97.95%	95.84%	97.02%	0.0004	0.0001
39.5	156,267,394	97.89%	95.33%	96.66%	0.0007	0.0002
40.5	140,257,745	97.83%	94.77%	96.26%	0.0009	0.0002
41.5	125,480,141	97.75%	94.15%	95.83%	0.0013	0.0004
42.5	107,120,429	97.65%	93.47%	95.35%	0.0017	0.0005
43.5	87,360,990	97.53%	92.74%	94.83%	0.0023	0.0007
44.5	72,408,446	97.39%	91.94%	94.26%	0.0030	0.0010
45.5	58,761,002	97.18%	91.08%	93.65%	0.0037	0.0012
46.5	48,446,414	96.88%	90.14%	92.98%	0.0045	0.0015
47.5	39,557,422	96.51%	89.13%	92.26%	0.0055	0.0018
48.5	33,784,617	96.20%	88.04%	91.48%	0.0067	0.0022
49.5	27,382,632	95.85%	86.87%	90.65%	0.0081	0.0027
50.5	22,977,291	95.38%	85.63%	89.75%	0.0095	0.0032
51.5	19,208,153	94.87%	84.30%	88.78%	0.0112	0.0037
52.5	17,735,834	94.53%	82.88%	87.76%	0.0136	0.0046
53.5	15,609,969	94.21%	81.39%	86.66%	0.0164	0.0057
54.5	14,843,847	93.88%	79.80%	85.49%	0.0198	0.0070
55.5	14,378,034	93.61%	78.12%	84.25%	0.0240	0.0088
56.5	13,488,978	93.25%	76.34%	82.94%	0.0286	0.0106
57.5	12,872,716	92.90%	74.44%	81.55%	0.0341	0.0129
58.5	12,352,401	92.60%	72.42%	80.09%	0.0407	0.0157

Account 366 Curve Fitting

[1]	[2]	[3]	[4]	[5]	[6]	[7]
Age (Years)	**Exposures (Dollars)**	**Observed Life Table (OLT)**	**PG&E R4-65**	**TURN R4-70**	**PG&E SSD**	**TURN SSD**
59.5	11,054,016	92.12%	70.23%	78.55%	0.0479	0.0184
60.5	9,976,237	91.75%	67.90%	76.92%	0.0569	0.0220
61.5	8,642,709	91.23%	65.40%	75.21%	0.0667	0.0257
62.5	7,650,624	90.85%	62.73%	73.37%	0.0791	0.0305
63.5	6,338,157	90.46%	59.90%	71.42%	0.0934	0.0362
64.5	4,812,706	89.95%	56.92%	69.34%	0.1091	0.0425
65.5	3,584,063	89.33%	53.81%	67.11%	0.1262	0.0494
66.5	3,302,445	88.54%	50.59%	64.75%	0.1440	0.0566
67.5	3,256,050	87.31%	47.29%	62.23%	0.1601	0.0629
68.5	2,851,052	84.84%	43.95%	59.59%	0.1672	0.0638
69.5	2,639,429	81.85%	40.60%	56.81%	0.1702	0.0627
70.5	2,670,229	77.75%	37.26%	53.92%	0.1639	0.0568
71.5	2,667,262	74.90%	33.97%	50.94%	0.1675	0.0574
72.5	2,858,092	72.48%	30.78%	47.89%	0.1739	0.0605
73.5	2,994,800	69.24%	27.68%	44.79%	0.1727	0.0598
74.5	2,735,052	66.16%	24.73%	41.67%	0.1717	0.0600
75.5	2,483,689	64.31%	21.92%	38.57%	0.1797	0.0663
76.5	2,327,120	63.07%	19.29%	35.49%	0.1917	0.0760
77.5	2,052,903	61.98%	16.83%	32.48%	0.2039	0.0870
78.5	1,939,508	61.02%	14.55%	29.55%	0.2159	0.0991
79.5	1,750,912	60.43%	12.47%	26.72%	0.2300	0.1136
80.5	1,688,372	59.95%	10.57%	24.01%	0.2438	0.1292
81.5	1,637,938	59.51%	8.87%	21.44%	0.2565	0.1449
82.5	1,563,288	59.15%	7.34%	19.01%	0.2685	0.1611
83.5	1,496,805	58.85%	5.99%	16.74%	0.2794	0.1773
84.5	1,431,299	58.63%	4.80%	14.63%	0.2897	0.1936
85.5	1,318,923	58.48%	3.79%	12.68%	0.2991	0.2098
86.5	1,074,601	58.34%	2.92%	10.90%	0.3072	0.2250
87.5	887,580	58.16%	2.19%	9.27%	0.3132	0.2390
88.5	636,012	57.99%	1.59%	7.81%	0.3181	0.2518
89.5	511,802	57.84%	1.12%	6.50%	0.3217	0.2636
90.5	422,478	57.70%	0.75%	5.34%	0.3243	0.2742
91.5	236,513	57.56%	0.47%	4.32%	0.3259	0.2835
92.5	57,151	57.40%	0.28%	3.43%	0.3263	0.2913
93.5	4,065	57.22%	0.15%	2.67%	0.3257	0.2975
94.5	0	57.22%	0.07%	2.03%		
Sum of Squared Differences				[8]	7.5285	4.4338
Up to 1% of Beginning Exposures				[9]	0.0738	0.0242

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

Account 367 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] PG&E R3-50	[5] TURN R3-54	[6] PG&E SSD	[7] TURN SSD
0.0	2,843,051,312	100.00%	100.00%	100.00%	0.0000	0.0000
0.5	2,742,759,827	99.99%	99.98%	99.99%	0.0000	0.0000
1.5	2,690,864,150	99.98%	99.95%	99.95%	0.0000	0.0000
2.5	2,595,672,571	99.97%	99.91%	99.92%	0.0000	0.0000
3.5	2,408,488,945	99.94%	99.86%	99.87%	0.0000	0.0000
4.5	2,222,270,042	99.86%	99.80%	99.82%	0.0000	0.0000
5.5	2,088,923,710	99.83%	99.74%	99.77%	0.0000	0.0000
6.5	2,007,759,590	99.79%	99.66%	99.70%	0.0000	0.0000
7.5	1,948,260,158	99.77%	99.57%	99.62%	0.0000	0.0000
8.5	1,956,355,973	99.76%	99.48%	99.54%	0.0000	0.0000
9.5	1,964,127,904	99.74%	99.36%	99.44%	0.0000	0.0000
10.5	1,919,767,527	99.72%	99.23%	99.33%	0.0000	0.0000
11.5	1,884,453,301	99.68%	99.09%	99.21%	0.0000	0.0000
12.5	1,848,446,073	99.62%	98.92%	99.07%	0.0000	0.0000
13.5	1,848,550,198	99.55%	98.74%	98.92%	0.0001	0.0000
14.5	1,788,094,812	99.47%	98.53%	98.75%	0.0001	0.0001
15.5	1,729,721,920	99.39%	98.30%	98.56%	0.0001	0.0001
16.5	1,669,489,417	99.29%	98.04%	98.35%	0.0002	0.0001
17.5	1,613,537,000	99.15%	97.75%	98.12%	0.0002	0.0001
18.5	1,555,815,069	98.99%	97.43%	97.86%	0.0002	0.0001
19.5	1,477,852,295	98.82%	97.08%	97.58%	0.0003	0.0002
20.5	1,374,405,608	98.60%	96.70%	97.27%	0.0004	0.0002
21.5	1,319,815,396	98.37%	96.28%	96.93%	0.0004	0.0002
22.5	1,307,790,755	98.08%	95.81%	96.56%	0.0005	0.0002
23.5	1,246,261,008	97.79%	95.31%	96.16%	0.0006	0.0003
24.5	1,191,467,512	97.45%	94.76%	95.72%	0.0007	0.0003
25.5	1,114,758,184	97.03%	94.16%	95.25%	0.0008	0.0003
26.5	1,002,518,764	96.57%	93.51%	94.74%	0.0009	0.0003
27.5	887,668,742	96.05%	92.81%	94.18%	0.0010	0.0003
28.5	762,505,036	95.48%	92.05%	93.59%	0.0012	0.0004
29.5	670,965,562	94.86%	91.23%	92.94%	0.0013	0.0004
30.5	578,136,894	94.23%	90.35%	92.25%	0.0015	0.0004
31.5	500,169,426	93.47%	89.40%	91.51%	0.0017	0.0004
32.5	413,478,869	92.67%	88.38%	90.72%	0.0018	0.0004
33.5	372,778,178	91.83%	87.29%	89.87%	0.0021	0.0004
34.5	342,894,478	91.07%	86.11%	88.96%	0.0025	0.0004
35.5	308,667,806	90.14%	84.85%	87.98%	0.0028	0.0005
36.5	260,940,534	88.88%	83.51%	86.94%	0.0029	0.0004
37.5	212,954,386	87.04%	82.07%	85.84%	0.0025	0.0001
38.5	174,964,187	85.30%	80.53%	84.66%	0.0023	0.0000
39.5	150,183,549	83.72%	78.89%	83.40%	0.0023	0.0000
40.5	124,462,865	82.61%	77.14%	82.07%	0.0030	0.0000
41.5	100,439,067	81.76%	75.28%	80.64%	0.0042	0.0001
42.5	80,423,350	80.74%	73.30%	79.14%	0.0055	0.0003
43.5	63,361,384	79.59%	71.21%	77.53%	0.0070	0.0004
44.5	49,628,038	78.41%	69.00%	75.84%	0.0089	0.0007
45.5	37,237,350	77.23%	66.66%	74.05%	0.0112	0.0010
46.5	27,194,551	76.00%	64.21%	72.15%	0.0139	0.0015

Account 367 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] PG&E R3-50	[5] TURN R3-54	[6] PG&E SSD	[7] TURN SSD
47.5	19,378,795	75.14%	61.64%	70.16%	0.0182	0.0025
48.5	14,649,734	74.39%	58.95%	68.06%	0.0238	0.0040
49.5	8,649,496	73.35%	56.17%	65.85%	0.0295	0.0056
50.5	5,923,824	72.60%	53.29%	63.55%	0.0373	0.0082
51.5	3,310,017	71.80%	50.34%	61.14%	0.0461	0.0114
52.5	2,258,063	71.06%	47.32%	58.65%	0.0564	0.0154
53.5	1,286,872	70.36%	44.25%	56.06%	0.0682	0.0204
54.5	902,397	69.71%	41.16%	53.40%	0.0815	0.0266
55.5	565,308	69.12%	38.07%	50.67%	0.0964	0.0341
56.5	279,870	66.61%	35.00%	47.88%	0.0999	0.0351
57.5	163,696	66.22%	31.98%	45.05%	0.1172	0.0448
58.5	35,453	25.40%	29.03%	42.20%		
Sum of Squared Differences				[8]	0.7597	0.2187
Up to 1% of Beginning Exposures				[9]	0.0713	0.0092

[1] Age in years using half-year convention

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

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

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

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

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

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

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

Account 368.01 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] PG&E R2.5-32	[5] TURN R2.5-34	[6] PG&E SSD	[7] TURN SSD
0.0	2,143,199,851	100.00%	100.00%	100.00%	0.0000	0.0000
0.5	2,003,981,126	100.00%	99.91%	99.92%	0.0000	0.0000
1.5	1,846,960,313	99.99%	99.72%	99.74%	0.0000	0.0000
2.5	1,674,833,743	99.97%	99.50%	99.54%	0.0000	0.0000
3.5	1,528,918,034	99.92%	99.25%	99.31%	0.0000	0.0000
4.5	1,381,087,046	99.82%	98.97%	99.05%	0.0001	0.0001
5.5	1,225,330,560	99.65%	98.66%	98.76%	0.0001	0.0001
6.5	1,087,513,659	99.48%	98.30%	98.44%	0.0001	0.0001
7.5	958,886,208	99.26%	97.89%	98.08%	0.0002	0.0001
8.5	894,340,982	98.99%	97.44%	97.67%	0.0002	0.0002
9.5	836,187,655	98.67%	96.93%	97.22%	0.0003	0.0002
10.5	781,038,765	98.31%	96.35%	96.71%	0.0004	0.0003
11.5	726,539,058	97.89%	95.71%	96.15%	0.0005	0.0003
12.5	704,491,880	97.41%	94.99%	95.53%	0.0006	0.0004
13.5	697,025,609	96.84%	94.19%	94.84%	0.0007	0.0004
14.5	677,443,533	96.18%	93.31%	94.07%	0.0008	0.0004
15.5	656,206,669	95.43%	92.32%	93.22%	0.0010	0.0005
16.5	630,727,795	94.58%	91.24%	92.29%	0.0011	0.0005
17.5	600,527,766	93.64%	90.04%	91.27%	0.0013	0.0006
18.5	575,969,909	92.56%	88.72%	90.15%	0.0015	0.0006
19.5	557,981,302	91.39%	87.27%	88.92%	0.0017	0.0006
20.5	538,832,642	90.09%	85.69%	87.58%	0.0019	0.0006
21.5	516,414,035	88.72%	83.95%	86.12%	0.0023	0.0007
22.5	482,077,813	87.24%	82.05%	84.53%	0.0027	0.0007
23.5	453,302,940	85.66%	79.99%	82.80%	0.0032	0.0008
24.5	440,937,975	83.90%	77.74%	80.92%	0.0038	0.0009
25.5	420,773,356	82.01%	75.30%	78.89%	0.0045	0.0010
26.5	389,808,472	79.92%	72.65%	76.69%	0.0053	0.0010
27.5	357,724,709	77.66%	69.80%	74.31%	0.0062	0.0011
28.5	326,361,943	75.18%	66.73%	71.75%	0.0071	0.0012
29.5	299,512,260	72.52%	63.45%	69.01%	0.0082	0.0012
30.5	275,292,312	69.64%	59.96%	66.07%	0.0094	0.0013
31.5	242,556,249	66.62%	56.29%	62.95%	0.0107	0.0013
32.5	205,459,410	63.41%	52.44%	59.65%	0.0120	0.0014
33.5	175,191,300	60.01%	48.46%	56.17%	0.0133	0.0015
34.5	151,368,773	56.48%	44.39%	52.55%	0.0146	0.0015
35.5	132,802,572	52.82%	40.27%	48.81%	0.0157	0.0016
36.5	111,832,316	49.05%	36.17%	44.99%	0.0166	0.0016
37.5	92,388,873	45.24%	32.15%	41.12%	0.0171	0.0017
38.5	75,286,964	41.52%	28.27%	37.25%	0.0176	0.0018
39.5	58,985,684	37.91%	24.57%	33.44%	0.0178	0.0020
40.5	46,165,398	34.25%	21.11%	29.73%	0.0173	0.0020
41.5	37,028,073	30.72%	17.93%	26.17%	0.0164	0.0021
42.5	29,858,077	27.32%	15.04%	22.81%	0.0151	0.0020
43.5	23,130,703	24.15%	12.45%	19.67%	0.0137	0.0020
44.5	17,793,187	21.15%	10.17%	16.78%	0.0121	0.0019
45.5	13,628,979	18.36%	8.18%	14.16%	0.0104	0.0018
46.5	10,076,563	15.82%	6.47%	11.82%	0.0087	0.0016

Account 368.01 Curve Fitting

[1]	[2]	[3]	[4]	[5]	[6]	[7]
Age (Years)	**Exposures (Dollars)**	**Observed Life Table (OLT)**	**PG&E R2.5-32**	**TURN R2.5-34**	**PG&E SSD**	**TURN SSD**
47.5	7,262,668	13.59%	5.03%	9.73%	0.0073	0.0015
48.5	5,004,402	11.62%	3.83%	7.91%	0.0061	0.0014
49.5	3,263,570	9.84%	2.85%	6.34%	0.0049	0.0012
50.5	2,040,601	8.26%	2.07%	4.99%	0.0038	0.0011
51.5	1,181,949	7.12%	1.46%	3.86%	0.0032	0.0011
52.5	701,423	6.28%	1.00%	2.93%	0.0028	0.0011
53.5	388,684	5.48%	0.65%	2.17%	0.0023	0.0011
54.5	139,290	3.78%	0.39%	1.57%		
Sum of Squared Differences				[8]	0.3247	0.0523
Up to 1% of Beginning Exposures				[9]	0.2631	0.0386

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

Account 369.01 Curve Fitting

[1]	[2]	[3]	[4]	[5]	[6]	[7]
Age (Years)	**Exposures (Dollars)**	**Observed Life Table (OLT)**	**PG&E R2.5-55**	**TURN R2.5-59**	**PG&E SSD**	**TURN SSD**
0.0	498,263,872	100.00%	100.00%	100.00%	0.0000	0.0000
0.5	479,930,589	100.00%	99.95%	99.95%	0.0000	0.0000
1.5	436,557,440	99.93%	99.84%	99.85%	0.0000	0.0000
2.5	405,386,609	99.79%	99.73%	99.75%	0.0000	0.0000
3.5	386,644,837	99.63%	99.61%	99.64%	0.0000	0.0000
4.5	373,956,051	99.48%	99.47%	99.52%	0.0000	0.0000
5.5	388,764,203	99.35%	99.33%	99.39%	0.0000	0.0000
6.5	390,015,500	99.23%	99.18%	99.25%	0.0000	0.0000
7.5	383,546,919	99.10%	99.01%	99.10%	0.0000	0.0000
8.5	381,015,227	98.99%	98.84%	98.94%	0.0000	0.0000
9.5	370,640,577	98.89%	98.65%	98.77%	0.0000	0.0000
10.5	371,968,629	98.79%	98.44%	98.59%	0.0000	0.0000
11.5	367,112,055	98.66%	98.22%	98.40%	0.0000	0.0000
12.5	369,887,954	98.52%	97.99%	98.19%	0.0000	0.0000
13.5	367,586,372	98.36%	97.74%	97.97%	0.0000	0.0000
14.5	355,651,122	98.18%	97.47%	97.73%	0.0001	0.0000
15.5	343,699,723	98.01%	97.18%	97.48%	0.0001	0.0000
16.5	335,561,067	97.84%	96.87%	97.22%	0.0001	0.0000
17.5	329,101,292	97.68%	96.54%	96.93%	0.0001	0.0001
18.5	316,074,589	97.52%	96.19%	96.63%	0.0002	0.0001
19.5	303,441,392	97.35%	95.81%	96.31%	0.0002	0.0001
20.5	308,679,143	97.19%	95.41%	95.96%	0.0003	0.0002
21.5	311,111,833	97.04%	94.99%	95.60%	0.0004	0.0002
22.5	308,392,663	96.90%	94.53%	95.21%	0.0006	0.0003
23.5	301,113,606	96.76%	94.05%	94.80%	0.0007	0.0004
24.5	268,307,508	96.61%	93.53%	94.37%	0.0009	0.0005
25.5	246,297,678	96.44%	92.99%	93.91%	0.0012	0.0006
26.5	224,338,492	96.28%	92.41%	93.43%	0.0015	0.0008
27.5	206,109,887	96.10%	91.80%	92.91%	0.0019	0.0010
28.5	186,963,855	95.91%	91.15%	92.37%	0.0023	0.0013
29.5	169,733,259	95.71%	90.46%	91.80%	0.0028	0.0015
30.5	155,447,918	95.49%	89.73%	91.19%	0.0033	0.0018
31.5	139,122,676	95.27%	88.96%	90.55%	0.0040	0.0022
32.5	124,301,753	95.04%	88.15%	89.88%	0.0048	0.0027
33.5	115,409,757	94.81%	87.29%	89.17%	0.0057	0.0032
34.5	108,191,062	94.58%	86.38%	88.43%	0.0067	0.0038
35.5	100,811,926	94.35%	85.43%	87.64%	0.0080	0.0045
36.5	92,585,212	94.10%	84.42%	86.82%	0.0094	0.0053
37.5	84,523,134	93.84%	83.36%	85.95%	0.0110	0.0062
38.5	77,404,336	93.57%	82.25%	85.04%	0.0128	0.0073
39.5	70,266,770	93.28%	81.08%	84.09%	0.0149	0.0084
40.5	63,803,215	92.97%	79.85%	83.09%	0.0172	0.0098
41.5	57,189,191	92.65%	78.56%	82.04%	0.0199	0.0113
42.5	50,634,161	92.31%	77.20%	80.94%	0.0228	0.0129
43.5	45,567,290	91.95%	75.78%	79.78%	0.0262	0.0148
44.5	41,562,474	91.57%	74.29%	78.58%	0.0299	0.0169
45.5	37,801,641	91.18%	72.73%	77.32%	0.0341	0.0192
46.5	34,403,839	90.77%	71.10%	76.00%	0.0387	0.0218
47.5	31,248,719	90.34%	69.39%	74.62%	0.0439	0.0247
48.5	28,128,214	89.89%	67.62%	73.18%	0.0496	0.0279
49.5	25,411,530	89.42%	65.77%	71.69%	0.0559	0.0314

Account 369.01 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] PG&E R2.5-55	[5] TURN R2.5-59	[6] PG&E SSD	[7] TURN SSD
50.5	22,852,153	88.92%	63.85%	70.12%	0.0628	0.0353
51.5	20,580,039	88.42%	61.86%	68.50%	0.0705	0.0397
52.5	18,544,326	87.90%	59.80%	66.81%	0.0790	0.0445
53.5	16,510,103	87.36%	57.68%	65.06%	0.0881	0.0497
54.5	14,694,824	86.82%	55.50%	63.25%	0.0981	0.0556
55.5	12,955,135	86.22%	53.26%	61.38%	0.1087	0.0617
56.5	11,331,598	85.60%	50.97%	59.45%	0.1199	0.0684
57.5	9,732,442	84.91%	48.64%	57.46%	0.1315	0.0754
58.5	8,233,763	84.24%	46.28%	55.42%	0.1441	0.0831
59.5	6,981,146	83.56%	43.90%	53.33%	0.1573	0.0914
60.5	5,770,895	82.86%	41.51%	51.20%	0.1710	0.1002
61.5	4,745,758	82.07%	39.11%	49.04%	0.1845	0.1091
62.5	3,889,315	81.31%	36.73%	46.85%	0.1987	0.1188
63.5	3,162,685	80.48%	34.37%	44.63%	0.2126	0.1285
64.5	2,781,285	79.65%	32.04%	42.40%	0.2266	0.1388
65.5	2,257,566	78.72%	29.76%	40.17%	0.2397	0.1486
66.5	1,740,191	77.71%	27.54%	37.94%	0.2517	0.1582
67.5	1,300,577	76.61%	25.39%	35.73%	0.2623	0.1671
68.5	905,839	75.12%	23.32%	33.54%	0.2684	0.1729
69.5	551,549	73.42%	21.33%	31.38%	0.2714	0.1767
70.5	281,669	72.12%	19.43%	29.27%	0.2777	0.1836
71.5	142,606	70.64%	17.62%	27.21%	0.2811	0.1886
72.5	79,443	69.19%	15.92%	25.21%	0.2837	0.1934
73.5	47,595	67.80%	14.32%	23.28%	0.2860	0.1982
74.5	32,036	66.43%	12.83%	21.42%	0.2873	0.2025
75.5	3,217	64.65%	11.44%	19.64%		
76.5		30.56%	10.15%	17.95%		
Sum of Squared Differences				[8]	5.1947	3.2333
Up to 1% of Beginning Exposures				[9]	1.6630	0.9482

[1] Age in years using half-year convention

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

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

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

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

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

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

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

Account 369.02 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] PG&E R4-50	[5] TURN R4-53	[6] PG&E SSD	[7] TURN SSD
0.0	1,262,734,942	100.00%	100.00%	100.00%	0.0000	0.0000
0.5	1,226,437,207	100.00%	100.00%	100.00%	0.0000	0.0000
1.5	1,211,760,281	100.00%	100.00%	100.00%	0.0000	0.0000
2.5	1,195,650,519	100.00%	99.99%	99.99%	0.0000	0.0000
3.5	1,187,215,666	99.99%	99.99%	99.99%	0.0000	0.0000
4.5	1,178,201,148	99.99%	99.99%	99.99%	0.0000	0.0000
5.5	1,187,569,143	99.98%	99.98%	99.98%	0.0000	0.0000
6.5	1,205,314,335	99.97%	99.97%	99.97%	0.0000	0.0000
7.5	1,204,477,173	99.96%	99.96%	99.97%	0.0000	0.0000
8.5	1,189,968,568	99.95%	99.95%	99.95%	0.0000	0.0000
9.5	1,209,542,172	99.94%	99.93%	99.94%	0.0000	0.0000
10.5	1,201,739,065	99.92%	99.91%	99.92%	0.0000	0.0000
11.5	1,184,541,947	99.90%	99.88%	99.90%	0.0000	0.0000
12.5	1,174,513,660	99.88%	99.85%	99.87%	0.0000	0.0000
13.5	1,159,071,369	99.85%	99.81%	99.84%	0.0000	0.0000
14.5	1,125,436,064	99.80%	99.76%	99.80%	0.0000	0.0000
15.5	1,090,773,447	99.74%	99.70%	99.75%	0.0000	0.0000
16.5	1,047,776,354	99.67%	99.62%	99.69%	0.0000	0.0000
17.5	1,006,941,027	99.57%	99.53%	99.62%	0.0000	0.0000
18.5	969,417,152	99.45%	99.43%	99.54%	0.0000	0.0000
19.5	943,251,266	99.32%	99.30%	99.44%	0.0000	0.0000
20.5	918,588,339	99.18%	99.14%	99.32%	0.0000	0.0000
21.5	897,429,908	99.03%	98.96%	99.18%	0.0000	0.0000
22.5	865,692,854	98.87%	98.75%	99.01%	0.0000	0.0000
23.5	834,505,559	98.70%	98.50%	98.82%	0.0000	0.0000
24.5	788,630,628	98.52%	98.20%	98.60%	0.0000	0.0000
25.5	735,139,105	98.31%	97.87%	98.34%	0.0000	0.0000
26.5	671,831,984	98.05%	97.47%	98.04%	0.0000	0.0000
27.5	624,865,427	97.76%	97.02%	97.70%	0.0001	0.0000
28.5	528,583,131	97.43%	96.51%	97.31%	0.0001	0.0000
29.5	468,054,372	97.06%	95.92%	96.86%	0.0001	0.0000
30.5	412,591,790	96.67%	95.25%	96.35%	0.0002	0.0000
31.5	354,746,652	96.25%	94.50%	95.78%	0.0003	0.0000
32.5	307,018,490	95.78%	93.65%	95.14%	0.0005	0.0000
33.5	269,963,102	95.29%	92.70%	94.41%	0.0007	0.0001
34.5	241,852,652	94.78%	91.65%	93.61%	0.0010	0.0001
35.5	217,115,823	94.26%	90.48%	92.71%	0.0014	0.0002
36.5	186,171,840	93.76%	89.18%	91.72%	0.0021	0.0004
37.5	154,399,819	93.31%	87.76%	90.62%	0.0031	0.0007
38.5	126,205,441	92.89%	86.20%	89.42%	0.0045	0.0012
39.5	102,162,437	92.49%	84.51%	88.10%	0.0064	0.0019
40.5	82,514,172	92.16%	82.67%	86.67%	0.0090	0.0030
41.5	66,997,502	91.84%	80.69%	85.11%	0.0124	0.0045
42.5	54,175,127	91.56%	78.55%	83.43%	0.0169	0.0066
43.5	42,302,595	91.25%	76.25%	81.62%	0.0225	0.0093
44.5	32,520,675	90.92%	73.76%	79.68%	0.0295	0.0126
45.5	24,106,795	90.52%	71.02%	77.60%	0.0380	0.0167
46.5	16,716,909	89.94%	68.03%	75.35%	0.0480	0.0213

Account 369.02 Curve Fitting

[1]	[2]	[3]	[4]	[5]	[6]	[7]
Age (Years)	**Exposures (Dollars)**	**Observed Life Table (OLT)**	**PG&E R4-50**	**TURN R4-53**	**PG&E SSD**	**TURN SSD**
47.5	11,603,299	89.15%	64.75%	72.92%	0.0595	0.0263
48.5	6,844,477	88.16%	61.20%	70.28%	0.0727	0.0320
49.5	4,049,764	86.70%	57.38%	67.39%	0.0860	0.0373
50.5	3,258,078	84.49%	53.33%	64.26%	0.0971	0.0409
51.5	2,049,037	81.58%	49.12%	60.88%	0.1054	0.0429
52.5	1,601,120	77.88%	44.79%	57.26%	0.1095	0.0425
53.5	1,280,266	74.55%	40.43%	53.45%	0.1164	0.0445
54.5	985,154	71.04%	36.10%	49.48%	0.1221	0.0465
55.5	809,925	68.84%	31.88%	45.41%	0.1366	0.0549
56.5	653,630	66.37%	27.83%	41.29%	0.1485	0.0629
57.5	459,345	59.87%	24.01%	37.20%	0.1286	0.0514
58.5	347,310	59.68%	20.44%	33.19%	0.1540	0.0702
59.5	250,545	59.51%	17.18%	29.30%	0.1792	0.0912
60.5	175,242	59.46%	14.22%	25.60%	0.2047	0.1146
61.5	125,410	59.40%	11.59%	22.12%	0.2286	0.1390
62.5	84,890	59.34%	9.27%	18.90%	0.2507	0.1636
63.5	61,683	59.28%	7.26%	15.94%	0.2706	0.1878
64.5	0	59.03%	5.55%	13.27%		
Sum of Squared Differences				[8]	2.6669	1.3273
Up to 1% of Beginning Exposures				[9]	0.1968	0.0789

[1] Age in years using half-year convention

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

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

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

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

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

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

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

Account 378 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] PG&E R2-55	[5] TURN R2-59	[6] PG&E SSD	[7] TURN SSD
0.0	303,631,438	100.00%	100.00%	100.00%	0.0000	0.0000
0.5	256,893,457	100.00%	99.91%	99.92%	0.0000	0.0000
1.5	215,658,527	99.95%	99.73%	99.75%	0.0000	0.0000
2.5	186,514,348	99.71%	99.54%	99.57%	0.0000	0.0000
3.5	164,074,922	99.40%	99.34%	99.39%	0.0000	0.0000
4.5	139,653,925	99.10%	99.12%	99.19%	0.0000	0.0000
5.5	113,476,075	98.74%	98.89%	98.98%	0.0000	0.0000
6.5	102,574,557	98.24%	98.65%	98.76%	0.0000	0.0000
7.5	93,120,054	97.74%	98.39%	98.53%	0.0000	0.0001
8.5	87,581,408	97.48%	98.12%	98.28%	0.0000	0.0001
9.5	86,075,567	97.29%	97.83%	98.02%	0.0000	0.0001
10.5	85,088,244	97.18%	97.53%	97.75%	0.0000	0.0000
11.5	82,908,743	96.99%	97.21%	97.46%	0.0000	0.0000
12.5	81,083,248	96.84%	96.87%	97.16%	0.0000	0.0000
13.5	79,758,706	96.71%	96.52%	96.84%	0.0000	0.0000
14.5	76,334,796	96.47%	96.14%	96.51%	0.0000	0.0000
15.5	72,282,304	96.29%	95.75%	96.16%	0.0000	0.0000
16.5	67,781,571	95.95%	95.33%	95.79%	0.0000	0.0000
17.5	63,389,211	95.65%	94.89%	95.41%	0.0001	0.0000
18.5	59,746,233	95.38%	94.43%	95.00%	0.0001	0.0000
19.5	54,254,430	95.12%	93.95%	94.58%	0.0001	0.0000
20.5	49,560,268	94.85%	93.44%	94.14%	0.0002	0.0001
21.5	46,310,844	94.55%	92.91%	93.67%	0.0003	0.0001
22.5	42,333,931	94.30%	92.35%	93.19%	0.0004	0.0001
23.5	37,491,462	93.94%	91.76%	92.68%	0.0005	0.0002
24.5	35,374,468	93.63%	91.15%	92.15%	0.0006	0.0002
25.5	31,506,054	93.24%	90.50%	91.60%	0.0007	0.0003
26.5	27,618,744	92.89%	89.83%	91.02%	0.0009	0.0004
27.5	24,717,138	92.51%	89.13%	90.41%	0.0011	0.0004
28.5	21,716,116	92.05%	88.39%	89.78%	0.0013	0.0005
29.5	19,569,849	91.71%	87.62%	89.13%	0.0017	0.0007
30.5	17,954,449	91.38%	86.81%	88.44%	0.0021	0.0009
31.5	16,601,733	91.00%	85.97%	87.73%	0.0025	0.0011
32.5	16,037,384	90.39%	85.10%	86.98%	0.0028	0.0012
33.5	15,667,889	89.92%	84.18%	86.21%	0.0033	0.0014
34.5	15,081,164	89.44%	83.23%	85.40%	0.0039	0.0016
35.5	14,477,474	88.68%	82.24%	84.56%	0.0042	0.0017
36.5	13,980,882	87.88%	81.20%	83.69%	0.0045	0.0018
37.5	13,360,508	87.25%	80.13%	82.78%	0.0051	0.0020
38.5	13,081,061	86.80%	79.01%	81.84%	0.0061	0.0025
39.5	12,937,345	86.54%	77.85%	80.86%	0.0076	0.0032
40.5	12,393,518	85.93%	76.64%	79.85%	0.0086	0.0037
41.5	11,938,080	85.23%	75.39%	78.80%	0.0097	0.0041
42.5	11,166,144	84.13%	74.09%	77.71%	0.0101	0.0041
43.5	10,499,631	83.25%	72.75%	76.58%	0.0110	0.0045
44.5	9,201,637	82.34%	71.36%	75.41%	0.0121	0.0048
45.5	8,040,124	81.53%	69.92%	74.20%	0.0135	0.0054
46.5	7,338,956	80.59%	68.43%	72.95%	0.0148	0.0058
47.5	6,905,892	79.45%	66.90%	71.66%	0.0158	0.0061
48.5	6,723,392	78.83%	65.32%	70.34%	0.0182	0.0072
49.5	6,035,069	78.01%	63.70%	68.97%	0.0205	0.0082
50.5	5,514,336	77.06%	62.03%	67.55%	0.0226	0.0090
51.5	4,375,294	75.80%	60.32%	66.10%	0.0240	0.0094
52.5	3,922,623	74.68%	58.57%	64.61%	0.0260	0.0101

Account 378 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] PG&E R2-55	[5] TURN R2-59	[6] PG&E SSD	[7] TURN SSD
53.5	3,466,907	73.64%	56.78%	63.08%	0.0284	0.0111
54.5	3,121,364	72.34%	54.95%	61.51%	0.0302	0.0117
55.5	2,631,969	70.97%	53.09%	59.91%	0.0320	0.0122
56.5	2,379,761	69.07%	51.20%	58.27%	0.0319	0.0117
57.5	2,164,014	66.80%	49.28%	56.59%	0.0307	0.0104
58.5	1,876,352	64.23%	47.33%	54.89%	0.0285	0.0087
59.5	1,631,609	61.51%	45.37%	53.15%	0.0260	0.0070
60.5	1,292,017	60.58%	43.40%	51.39%	0.0295	0.0084
61.5	1,137,601	59.52%	41.41%	49.60%	0.0328	0.0098
62.5	996,753	58.45%	39.42%	47.80%	0.0362	0.0113
63.5	825,261	57.25%	37.43%	45.97%	0.0393	0.0127
64.5	666,443	55.98%	35.45%	44.13%	0.0421	0.0140
65.5	502,615	54.80%	33.49%	42.29%	0.0454	0.0157
66.5	405,596	53.64%	31.54%	40.43%	0.0488	0.0174
67.5	306,861	51.93%	29.62%	38.58%	0.0498	0.0178
68.5	245,018	49.58%	27.73%	36.73%	0.0477	0.0165
69.5	194,396	46.43%	25.88%	34.89%	0.0422	0.0133
70.5	165,668	44.37%	24.08%	33.06%	0.0412	0.0128
71.5	135,190	42.19%	22.32%	31.25%	0.0395	0.0120
72.5	105,989	39.95%	20.62%	29.46%	0.0374	0.0110
73.5	76,450	38.23%	18.98%	27.70%	0.0371	0.0111
74.5	52,932	35.21%	17.40%	25.98%	0.0317	0.0085
75.5	40,294	33.33%	15.88%	24.29%	0.0304	0.0082
76.5	29,645	32.15%	14.44%	22.64%	0.0314	0.0090
77.5	20,279	31.05%	13.07%	21.05%	0.0323	0.0100
78.5	15,708	29.84%	11.77%	19.50%	0.0326	0.0107
79.5	9,095	28.93%	10.55%	18.00%	0.0338	0.0119
80.5	3,932	28.18%	9.40%	16.57%	0.0353	0.0135
81.5	1,973	27.43%	8.33%	15.19%	0.0365	0.0150
82.5	1,057	26.18%	7.33%	13.87%	0.0355	0.0151
83.5	0	25.40%	6.41%	12.62%		
Sum of Squared Differences				[8]	1.3334	0.4618
Up to 1% of Beginning Exposures				[9]	0.3156	0.1258

[1] Age in years using half-year convention

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

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

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

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

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

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

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

Account 380 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] PG&E R3-57	[5] TURN R3-60	[6] PG&E SSD	[7] TURN SSD
0.0	2,773,451,324	100.00%	100.00%	100.00%	0.0000	0.0000
0.5	2,507,921,018	100.00%	99.99%	99.99%	0.0000	0.0000
1.5	2,273,228,127	99.98%	99.96%	99.96%	0.0000	0.0000
2.5	2,130,259,463	99.90%	99.92%	99.93%	0.0000	0.0000
3.5	1,947,825,940	99.84%	99.88%	99.89%	0.0000	0.0000
4.5	1,625,150,142	99.78%	99.84%	99.85%	0.0000	0.0000
5.5	1,520,059,037	99.75%	99.78%	99.80%	0.0000	0.0000
6.5	1,498,299,358	99.72%	99.72%	99.74%	0.0000	0.0000
7.5	1,498,570,252	99.69%	99.66%	99.68%	0.0000	0.0000
8.5	1,493,635,354	99.64%	99.58%	99.61%	0.0000	0.0000
9.5	1,467,018,372	99.58%	99.49%	99.53%	0.0000	0.0000
10.5	1,476,253,494	99.51%	99.40%	99.45%	0.0000	0.0000
11.5	1,462,419,308	99.44%	99.29%	99.35%	0.0000	0.0000
12.5	1,461,407,257	99.36%	99.17%	99.24%	0.0000	0.0000
13.5	1,452,648,951	99.27%	99.03%	99.12%	0.0000	0.0000
14.5	1,420,500,996	99.19%	98.88%	98.99%	0.0000	0.0000
15.5	1,379,625,069	99.08%	98.72%	98.85%	0.0000	0.0000
16.5	1,340,495,232	98.97%	98.53%	98.68%	0.0000	0.0000
17.5	1,308,721,714	98.84%	98.33%	98.51%	0.0000	0.0000
18.5	1,265,846,787	98.69%	98.11%	98.32%	0.0000	0.0000
19.5	1,232,064,875	98.57%	97.87%	98.10%	0.0000	0.0000
20.5	1,171,292,055	98.42%	97.60%	97.87%	0.0001	0.0000
21.5	1,127,451,389	98.27%	97.31%	97.62%	0.0001	0.0000
22.5	1,091,257,412	98.12%	96.99%	97.35%	0.0001	0.0001
23.5	1,022,181,981	97.95%	96.65%	97.05%	0.0002	0.0001
24.5	956,752,218	97.76%	96.28%	96.73%	0.0002	0.0001
25.5	869,686,401	97.54%	95.88%	96.38%	0.0003	0.0001
26.5	781,112,955	97.28%	95.44%	96.01%	0.0003	0.0002
27.5	703,505,821	97.01%	94.97%	95.61%	0.0004	0.0002
28.5	628,899,258	96.70%	94.47%	95.17%	0.0005	0.0002
29.5	555,156,676	96.37%	93.92%	94.71%	0.0006	0.0003
30.5	503,204,169	96.02%	93.34%	94.21%	0.0007	0.0003
31.5	443,483,669	95.66%	92.71%	93.68%	0.0009	0.0004
32.5	393,600,752	95.27%	92.04%	93.11%	0.0010	0.0005
33.5	367,472,379	94.85%	91.33%	92.50%	0.0012	0.0006
34.5	349,347,891	94.38%	90.56%	91.85%	0.0015	0.0006
35.5	332,240,563	93.84%	89.75%	91.16%	0.0017	0.0007
36.5	312,882,450	93.30%	88.88%	90.43%	0.0020	0.0008
37.5	289,094,971	92.69%	87.96%	89.64%	0.0022	0.0009
38.5	264,910,241	92.05%	86.97%	88.81%	0.0026	0.0010
39.5	245,918,585	91.34%	85.93%	87.93%	0.0029	0.0012
40.5	223,310,161	90.56%	84.82%	87.00%	0.0033	0.0013
41.5	204,732,330	89.77%	83.64%	86.01%	0.0038	0.0014
42.5	186,667,963	88.93%	82.39%	84.96%	0.0043	0.0016
43.5	168,600,796	88.02%	81.06%	83.85%	0.0048	0.0017
44.5	151,910,018	87.06%	79.66%	82.68%	0.0055	0.0019
45.5	136,934,852	86.05%	78.18%	81.44%	0.0062	0.0021
46.5	124,014,231	85.03%	76.61%	80.13%	0.0071	0.0024
47.5	111,839,858	83.93%	74.96%	78.75%	0.0081	0.0027
48.5	98,164,748	82.77%	73.21%	77.29%	0.0091	0.0030
49.5	87,533,126	81.54%	71.38%	75.75%	0.0103	0.0033

Account 380 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] PG&E R3-57	[5] TURN R3-60	[6] PG&E SSD	[7] TURN SSD
50.5	78,540,818	80.27%	69.45%	74.14%	0.0117	0.0038
51.5	70,242,264	78.93%	67.43%	72.44%	0.0132	0.0042
52.5	61,538,236	77.53%	65.32%	70.66%	0.0149	0.0047
53.5	52,826,968	76.06%	63.11%	68.80%	0.0168	0.0053
54.5	45,248,401	74.54%	60.82%	66.86%	0.0188	0.0059
55.5	39,166,264	72.93%	58.45%	64.83%	0.0210	0.0066
56.5	33,491,019	71.27%	55.99%	62.72%	0.0233	0.0073
57.5	27,966,614	69.49%	53.47%	60.53%	0.0257	0.0080
58.5	22,966,917	67.65%	50.88%	58.26%	0.0281	0.0088
59.5	19,189,385	65.69%	48.25%	55.93%	0.0304	0.0095
60.5	15,734,563	63.68%	45.57%	53.53%	0.0328	0.0103
61.5	12,720,389	61.56%	42.87%	51.08%	0.0349	0.0110
62.5	9,982,904	59.36%	40.16%	48.58%	0.0369	0.0116
63.5	7,841,232	57.04%	37.45%	46.04%	0.0384	0.0121
64.5	6,035,469	54.65%	34.77%	43.48%	0.0395	0.0125
65.5	4,541,986	52.09%	32.11%	40.91%	0.0399	0.0125
66.5	3,233,200	49.47%	29.52%	38.33%	0.0398	0.0124
67.5	2,230,987	47.04%	26.99%	35.77%	0.0402	0.0127
68.5	1,452,820	44.75%	24.54%	33.24%	0.0408	0.0133
69.5	863,853	42.49%	22.19%	30.74%	0.0412	0.0138
70.5	450,224	40.19%	19.96%	28.31%	0.0409	0.0141
71.5	272,743	37.74%	17.84%	25.94%	0.0396	0.0139
72.5	184,171	34.92%	15.84%	23.65%	0.0364	0.0127
73.5	133,318	31.77%	13.98%	21.46%	0.0317	0.0106
74.5	99,906	27.92%	12.25%	19.36%	0.0245	0.0073
75.5	65,182	18.21%	10.67%	17.37%	0.0057	0.0001
76.5	32,675	9.13%	9.21%	15.51%	0.0000	0.0041
77.5	10,175	2.84%	7.89%	13.76%		
Sum of Squared Differences				[8]	0.8493	0.2790
Up to 1% of Beginning Exposures				[9]	0.2275	0.0757

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

Account 381 Curve Fitting

[1] Age (Years)	[2] Exposures (Dollars)	[3] Observed Life Table (OLT)	[4] PG&E S1-28	[5] TURN S1-30	[6] PG&E SSD	[7] TURN SSD
0.0	950,252,266	100.00%	100.00%	100.00%	0.0000	0.0000
0.5	909,054,225	99.93%	100.00%	100.00%	0.0000	0.0000
1.5	854,470,437	99.53%	99.97%	99.98%	0.0000	0.0000
2.5	787,131,676	99.01%	99.88%	99.90%	0.0001	0.0001
3.5	727,277,753	98.42%	99.71%	99.76%	0.0002	0.0002
4.5	660,658,889	97.81%	99.42%	99.52%	0.0003	0.0003
5.5	598,018,345	97.28%	99.00%	99.17%	0.0003	0.0004
6.5	551,409,385	96.69%	98.44%	98.70%	0.0003	0.0004
7.5	485,894,794	96.27%	97.73%	98.11%	0.0002	0.0003
8.5	431,317,698	95.83%	96.85%	97.37%	0.0001	0.0002
9.5	385,869,193	95.33%	95.80%	96.48%	0.0000	0.0001
10.5	349,390,432	94.75%	94.57%	95.45%	0.0000	0.0000
11.5	320,511,230	94.06%	93.18%	94.26%	0.0001	0.0000
12.5	303,354,937	93.24%	91.60%	92.93%	0.0003	0.0000
13.5	286,658,342	92.33%	89.85%	91.44%	0.0006	0.0001
14.5	272,295,404	91.31%	87.94%	89.79%	0.0011	0.0002
15.5	251,779,044	90.22%	85.86%	88.00%	0.0019	0.0005
16.5	234,049,990	89.09%	83.62%	86.07%	0.0030	0.0009
17.5	220,322,164	87.88%	81.23%	84.00%	0.0044	0.0015
18.5	202,799,080	86.60%	78.71%	81.80%	0.0062	0.0023
19.5	185,807,583	85.18%	76.05%	79.48%	0.0083	0.0032
20.5	172,105,121	83.57%	73.28%	77.04%	0.0106	0.0043
21.5	159,577,467	81.80%	70.40%	74.49%	0.0130	0.0053
22.5	152,675,464	79.76%	67.42%	71.85%	0.0152	0.0063
23.5	144,245,497	77.44%	64.37%	69.12%	0.0171	0.0069
24.5	135,864,404	74.80%	61.24%	66.31%	0.0184	0.0072
25.5	127,259,353	71.94%	58.07%	63.43%	0.0192	0.0072
26.5	117,852,755	68.92%	54.86%	60.51%	0.0198	0.0071
27.5	107,436,580	65.81%	51.62%	57.53%	0.0201	0.0068
28.5	99,618,983	62.47%	48.38%	54.53%	0.0199	0.0063
29.5	90,528,241	58.99%	45.14%	51.51%	0.0192	0.0056
30.5	81,111,239	55.45%	41.93%	48.49%	0.0183	0.0048
31.5	68,752,156	51.92%	38.76%	45.47%	0.0173	0.0042
32.5	59,725,984	48.24%	35.63%	42.47%	0.0159	0.0033
33.5	52,502,785	44.54%	32.58%	39.49%	0.0143	0.0025
34.5	48,723,321	40.72%	29.60%	36.57%	0.0124	0.0017
35.5	43,833,501	36.82%	26.72%	33.69%	0.0102	0.0010
36.5	38,011,780	33.10%	23.95%	30.88%	0.0084	0.0005
37.5	32,718,266	29.65%	21.29%	28.15%	0.0070	0.0002
38.5	28,407,970	26.44%	18.77%	25.51%	0.0059	0.0001
39.5	24,397,923	23.55%	16.38%	22.96%	0.0051	0.0000
40.5	20,550,486	20.87%	14.14%	20.52%	0.0045	0.0000
41.5	16,927,416	18.44%	12.06%	18.20%	0.0041	0.0000
42.5	14,087,107	16.23%	10.15%	16.00%	0.0037	0.0000
43.5	11,579,257	14.25%	8.40%	13.93%	0.0034	0.0000
44.5	9,213,288	12.40%	6.82%	12.00%	0.0031	0.0000
45.5	7,122,024	10.70%	5.43%	10.21%	0.0028	0.0000
46.5	5,442,744	9.11%	4.20%	8.56%	0.0024	0.0000

Account 381 Curve Fitting

[1]	[2]	[3]	[4]	[5]	[6]	[7]
Age (Years)	**Exposures (Dollars)**	**Observed Life Table (OLT)**	**PG&E S1-28**	**TURN S1-30**	**PG&E SSD**	**TURN SSD**
47.5	3,901,968	7.62%	3.15%	7.07%	0.0020	0.0000
48.5	2,773,886	6.21%	2.27%	5.74%	0.0016	0.0000
49.5	2,001,015	5.02%	1.56%	4.55%	0.0012	0.0000
50.5	1,456,871	4.08%	1.00%	3.52%	0.0010	0.0000
51.5	970,506	3.41%	0.58%	2.63%	0.0008	0.0001
52.5	669,491	2.97%	0.29%	1.89%	0.0007	0.0001
53.5	443,663	2.71%	0.12%	1.30%	0.0007	0.0002
54.5	306,286	2.53%	0.03%	0.83%	0.0006	0.0003
55.5	213,096	2.38%	0.00%	0.48%	0.0006	0.0004
56.5	137,292	2.27%	0.00%	0.24%	0.0005	0.0004
57.5	71,950	2.18%	0.00%	0.10%	0.0005	0.0004
58.5	18,996	2.10%	0.00%	0.02%	0.0004	0.0004
59.5	10,175	2.03%	0.00%	0.00%		
Sum of Squared Differences				[8]	0.3492	0.0949
Up to 1% of Beginning Exposures				[9]	0.3304	0.0924

[1] Age in years using half-year convention

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

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

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

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

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

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

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

Electric Account 303.03 - Remaining Life

Exhibit DJG-19

[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
	Original	Average	Annual Accrual		Remaining	Future Accruals	
Year	Cost	Life	Rate	Amount	Life	Factor	Amount
2013	$ 281,864	10	10%	$ 28,186	5.5	0.55	$ 155,025.37
2014	1,194,159	10	10%	119,416	6.5	0.65	776,203
2016	188,570	10	10%	18,857	8.5	0.85	160,285
2017	1,462,032	10	10%	146,203	9.5	0.95	1,388,930
Total	$ 3,126,625			$ 312,663	7.93		$ 2,480,444

Survivor Curve:	**SQ-10**	[9]
Composite Remaining Life	**7.93**	[10]

[1], [2] See depreciation study
[3] Average life based on selected Iowa curve at [9]
[4] = 1 / [3]
[5] = [2] * [4]
[6] RL based on selected Iowa curve at [9]
[7] = [4] * [6]
[8] = [5] * [6]
[9] Selected Iowa curve
[10] = sum of [8] / sum of [5]

Gas Account 303.02 - Remaining Life

[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
	Original	Average	Annual Accrual		Remaining	Future Accruals	
Year	Cost	Life	Rate	Amount	Life	Factor	Amount
2013	$ 8,279,862	10	10%	$ 827,986	6.5	0.65	$ 5,381,910.61
2014	1,272,508	10	10%	127,251	7.5	0.75	954,381
2015	321	10	10%	32	8.5	0.85	273
2016	3,383,721	10	10%	338,372	9.5	0.95	3,214,535
Total	$ 12,936,413			$ 1,293,641	7.38		$ 9,551,100

Survivor Curve:	**SQ-10**	[9]
Composite Remaining Life	**7.38**	[10]

[1], [2] See depreciation study

[3] Average life based on selected Iowa curve at [9]

[4] = 1 / [3]

[5] = [2] * [4]

[6] RL based on selected Iowa curve at [9]

[7] = [4] * [6]

[8] = [5] * [6]

[9] Selected Iowa curve

[10] = sum of [8] / sum of [5]

Common Account 303.02 - Remaining Life

Exhibit DJG-21

[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
	Original	Average	Annual Accrual		Remaining	Future Accruals	
Year	Cost	Life	Rate	Amount	Life	Factor	Amount
2013	$ 214,846,145	10	10%	$ 21,484,614	5.5	0.55	$ 118,165,380
2014	193,757,643	10	10%	19,375,764	6.5	0.65	125,942,468
2015	330,683,067	10	10%	33,068,307	7.5	0.75	248,012,300
2016	188,393,426	10	10%	18,839,343	8.5	0.85	160,134,412
2017	141,168,721	10	10%	14,116,872	9.5	0.95	134,110,285
Total	$ 1,068,849,002			$ 106,884,900	7.36		$ 786,364,845

Survivor Curve:	**SQ-10**	[9]
Composite Remaining Life	**7.36**	[10]

[1], [2] See depreciation study
[3] Average life based on selected Iowa curve at [9]
[4] = 1 / [3]
[5] = [2] * [4]
[6] RL based on selected Iowa curve at [9]
[7] = [4] * [6]
[8] = [5] * [6]
[9] Selected Iowa curve
[10] = sum of [8] / sum of [5]

PGE
Electric Division
353.02 Station Equipment - Step Up Transformers

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 61 **Survivor Curve:** R1.5

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1919	64,942.09	61.00	1,064.61	6.79	7,223.96
1921	178,061.93	61.00	2,919.02	7.30	21,308.96
1922	8,802.78	61.00	144.31	7.57	1,092.36
1923	30,081.75	61.00	493.14	7.83	3,862.87
1924	66,364.23	61.00	1,087.93	8.10	8,815.97
1925	15,130.33	61.00	248.04	8.38	2,079.51
1926	8,083.60	61.00	132.52	8.66	1,147.62
1927	102,623.52	61.00	1,682.33	8.94	15,043.73
1928	132,289.67	61.00	2,168.66	9.23	20,021.16
1929	135,159.37	61.00	2,215.70	9.52	21,092.74
1930	32,909.18	61.00	539.49	9.81	5,293.69
1931	463,842.50	61.00	7,603.89	10.11	76,888.05
1932	9,562.82	61.00	156.77	10.41	1,632.04
1933	12,269.80	61.00	201.14	10.72	2,155.93
1934	18,432.52	61.00	302.17	11.02	3,331.27
1935	5,826.02	61.00	95.51	11.34	1,082.71
1936	598.73	61.00	9.82	11.66	114.41
1937	1,425.69	61.00	23.37	11.98	279.92
1938	1,739.25	61.00	28.51	12.30	350.80
1939	4,798.32	61.00	78.66	12.64	994.10
1940	59,402.05	61.00	973.79	12.98	12,635.61
1941	20,366.78	61.00	333.88	13.32	4,447.30
1942	9,685.38	61.00	158.78	13.67	2,170.78
1943	12,727.65	61.00	208.65	14.03	2,927.17
1944	742,563.03	61.00	12,173.03	14.39	175,216.00
1945	6,053.54	61.00	99.24	14.77	1,465.32
1946	17,842.24	61.00	292.49	15.14	4,429.73

PGE
Electric Division
353.02 Station Equipment - Step Up Transformers

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

***Average Service Life:* 61** ***Survivor Curve:* R1.5**

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1947	16,355.08	61.00	268.11	15.53	4,164.23
1948	389,633.31	61.00	6,387.36	15.93	101,724.37
1949	533,905.03	61.00	8,752.45	16.33	142,912.16
1950	1,028,115.69	61.00	16,854.17	16.74	282,112.69
1951	33,112.90	61.00	542.83	17.16	9,313.43
1952	11,019.50	61.00	180.65	17.58	3,176.52
1953	121,597.21	61.00	1,993.38	18.02	35,918.95
1954	216,407.75	61.00	3,547.63	18.46	65,501.04
1955	681,255.49	61.00	11,168.00	18.92	211,252.21
1956	369,261.95	61.00	6,053.41	19.38	117,292.24
1957	183,633.50	61.00	3,010.35	19.85	59,744.08
1958	2,058,857.81	61.00	33,751.40	20.32	685,937.89
1959	129,457.62	61.00	2,122.23	20.81	44,165.39
1960	11,837.85	61.00	194.06	21.31	4,134.79
1961	8,826.03	61.00	144.69	21.81	3,155.56
1962	268,494.03	61.00	4,401.49	22.32	98,253.72
1963	713,885.74	61.00	11,702.92	22.84	267,344.16
1964	40,167.46	61.00	658.48	23.37	15,390.29
1965	1,265,961.43	61.00	20,753.24	23.91	496,235.32
1966	62,981.95	61.00	1,032.48	24.46	25,252.06
1967	185,232.93	61.00	3,036.57	25.01	75,947.94
1968	48,399.34	61.00	793.42	25.57	20,291.24
1969	638,547.48	61.00	10,467.88	26.14	273,663.59
1970	708,744.14	61.00	11,618.63	26.72	310,482.34
1971	5,616.00	61.00	92.06	27.31	2,514.26
1972	183,875.27	61.00	3,014.32	27.90	84,106.41
1973	181,677.46	61.00	2,978.29	28.51	84,896.13

PGE
Electric Division
353.02 Station Equipment - Step Up Transformers
Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: **61** *Survivor Curve:* **R1.5**

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1974	164,483.62	61.00	2,696.42	29.11	78,505.52
1975	44,497.73	61.00	729.46	29.73	21,686.91
1976	107,258.49	61.00	1,758.32	30.35	53,373.13
1977	16,987.74	61.00	278.48	30.99	8,629.11
1978	11,033.97	61.00	180.88	31.62	5,720.03
1979	481,127.29	61.00	7,887.25	32.27	254,508.83
1980	775,392.83	61.00	12,711.22	32.92	418,455.43
1981	900,907.80	61.00	14,768.82	33.58	495,899.28
1982	3,848.00	61.00	63.08	34.24	2,160.07
1983	3,178,830.21	61.00	52,111.41	34.91	1,819,316.98
1984	27,384,418.66	61.00	448,920.03	35.59	15,977,095.10
1985	1,609,252.86	61.00	26,380.91	36.27	956,930.25
1986	6,540,364.13	61.00	107,217.92	36.96	3,962,916.59
1987	888,057.63	61.00	14,558.16	37.66	548,213.54
1988	1,799,645.67	61.00	29,502.07	38.36	1,131,620.40
1989	932,197.92	61.00	15,281.77	39.06	596,936.42
1990	170,514.31	61.00	2,795.29	39.77	111,178.51
1991	1,161,751.78	61.00	19,044.90	40.49	771,124.74
1992	2,728,351.61	61.00	44,726.59	41.21	1,843,186.60
1993	1,670,213.47	61.00	27,380.25	41.94	1,148,230.34
1994	2,095,770.08	61.00	34,356.51	42.67	1,465,847.20
1995	1,123,052.34	61.00	18,410.49	43.40	799,045.94
1996	692,028.33	61.00	11,344.60	44.14	500,768.43
1997	376,563.33	61.00	6,173.10	44.88	277,075.85
1998	2,229,666.20	61.00	36,551.51	45.63	1,667,956.33
1999	44,347.47	61.00	727.00	46.39	33,722.20
2000	118,292.97	61.00	1,939.21	47.14	91,415.67

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Electric Division

353.02 Station Equipment - Step Up Transformers

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2017

Based Upon Broad Group/Remaining Life Procedure and Technique

***Average Service Life:* 61** ***Survivor Curve:* R1.5**

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
2002	4,446,975.45	61.00	72,900.45	48.67	3,547,739.63
2003	1,251,004.16	61.00	20,508.04	49.43	1,013,769.96
2004	15,451,166.25	61.00	253,295.06	50.21	12,716,698.83
2005	3,490,286.49	61.00	57,217.19	50.98	2,916,985.66
2006	1,195,253.89	61.00	19,594.11	51.76	1,014,191.64
2007	112,768.24	61.00	1,848.64	52.54	97,134.66
2008	420,267.39	61.00	6,889.55	53.33	367,421.85
2009	2,131,795.41	61.00	34,947.09	54.12	1,891,408.46
2010	1,020,003.86	61.00	16,721.19	54.92	918,283.97
2011	1,834,687.65	61.00	30,076.52	55.72	1,675,726.70
2012	3,459,653.87	61.00	56,715.02	56.52	3,205,454.36
2014	231,174.71	61.00	3,789.71	58.13	220,314.24
2015	87,130.82	61.00	1,428.36	58.95	84,200.79
Total	104,639,469.35	61.00	1,715,382.55	40.01	68,632,836.85

Composite Average Remaining Life ...* 40.01 *Years

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Electric Division

353.03 Station Equip - Step Up Transformers - CC

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2017

Based Upon Broad Group/Remaining Life Procedure and Technique

***Average Service Life:* 61** ***Survivor Curve:* R1.5**

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
2009	11,983,037.03	61.00	196,441.10	54.12	10,631,797.71
2010	48,834,773.52	61.00	800,561.38	54.92	43,964,725.39
2011	875,160.12	61.00	14,346.73	55.72	799,334.52
2012	2,987,201.13	61.00	48,969.98	56.52	2,767,715.28
2014	194,855.77	61.00	3,194.32	58.13	185,701.54
2016	1,912,043.07	61.00	31,344.63	59.77	1,873,382.49
Total	66,787,070.64	61.00	1,094,858.15	55.00	60,222,656.94

Composite Average Remaining Life ... 55.00 Years

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Electric Division
355.00 Poles and Fixtures

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 58 **Survivor Curve: R1.5**

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1919	20.01	58.00	0.34	5.30	1.83
1920	835.73	58.00	14.41	5.53	79.63
1921	101.95	58.00	1.76	5.76	10.12
1922	587.14	58.00	10.12	6.00	60.79
1923	752.00	58.00	12.97	6.24	80.97
1925	504.90	58.00	8.71	6.75	58.74
1926	240.95	58.00	4.15	7.01	29.13
1927	718.77	58.00	12.39	7.27	90.15
1928	131.98	58.00	2.28	7.54	17.16
1929	302.76	58.00	5.22	7.82	40.83
1930	26.29	58.00	0.45	8.10	3.67
1931	66.07	58.00	1.14	8.38	9.54
1932	17.32	58.00	0.30	8.66	2.59
1933	44.34	58.00	0.76	8.95	6.84
1934	27.92	58.00	0.48	9.24	4.45
1935	41.04	58.00	0.71	9.54	6.75
1936	11.57	58.00	0.20	9.84	1.96
1937	45.25	58.00	0.78	10.14	7.91
1938	203.10	58.00	3.50	10.45	36.59
1939	5.58	58.00	0.10	10.76	1.04
1940	64.09	58.00	1.10	11.08	12.24
1941	210.40	58.00	3.63	11.40	41.36
1942	74.17	58.00	1.28	11.73	15.00
1943	2,025.52	58.00	34.92	12.06	421.25
1944	870.50	58.00	15.01	12.40	186.15
1945	771.36	58.00	13.30	12.75	169.55
1946	501.14	58.00	8.64	13.10	113.20

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Electric Division
355.00 Poles and Fixtures

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 58 **Survivor Curve: R1.5**

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1947	556.24	58.00	9.59	13.46	129.11
1948	19,095.43	58.00	329.23	13.83	4,552.90
1949	6,438.76	58.00	111.01	14.20	1,576.78
1950	4,080.46	58.00	70.35	14.59	1,026.18
1951	6,516.47	58.00	112.35	14.98	1,682.72
1952	20,514.39	58.00	353.69	15.38	5,438.45
1953	22,536.03	58.00	388.55	15.78	6,132.74
1954	26,167.44	58.00	451.16	16.20	7,308.68
1955	17,517.02	58.00	302.01	16.62	5,020.76
1956	24,751.18	58.00	426.74	17.06	7,279.34
1957	31,463.40	58.00	542.47	17.50	9,493.52
1958	17,007.39	58.00	293.23	17.95	5,263.82
1959	13,419.40	58.00	231.37	18.41	4,259.97
1960	18,048.06	58.00	311.17	18.88	5,875.53
1961	33,395.23	58.00	575.77	19.36	11,147.44
1962	28,004.00	58.00	482.82	19.85	9,582.84
1963	33,134.90	58.00	571.28	20.34	11,622.68
1964	37,070.96	58.00	639.15	20.85	13,326.77
1965	41,377.79	58.00	713.40	21.36	15,241.21
1966	76,879.94	58.00	1,325.50	21.89	29,013.27
1967	49,398.88	58.00	851.69	22.42	19,096.31
1968	58,783.76	58.00	1,013.50	22.96	23,273.11
1969	73,260.60	58.00	1,263.10	23.51	29,697.61
1970	59,411.03	58.00	1,024.32	24.07	24,656.33
1971	82,732.30	58.00	1,426.40	24.64	35,144.47
1972	86,024.63	58.00	1,483.17	25.21	37,396.81
1973	133,451.64	58.00	2,300.86	25.80	59,354.97

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Electric Division

355.00 Poles and Fixtures

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2017

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 58 **Survivor Curve: R1.5**

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1974	83,069.63	58.00	1,432.22	26.39	37,795.36
1975	102,979.09	58.00	1,775.48	26.99	47,919.70
1976	76,859.79	58.00	1,325.15	27.60	36,568.95
1977	91,349.55	58.00	1,574.97	28.21	44,433.96
1978	93,237.31	58.00	1,607.52	28.84	46,355.02
1979	81,184.25	58.00	1,399.71	29.47	41,245.84
1980	120,433.07	58.00	2,076.41	30.10	62,508.74
1981	127,066.51	58.00	2,190.78	30.75	67,367.12
1982	74,839.31	58.00	1,290.32	31.40	40,520.08
1983	115,179.44	58.00	1,985.83	32.06	63,670.90
1984	145,927.81	58.00	2,515.97	32.73	82,341.99
1985	363,330.53	58.00	6,264.25	33.40	209,232.10
1986	320,614.50	58.00	5,527.77	34.08	188,388.57
1987	242,573.54	58.00	4,182.25	34.76	145,393.82
1988	201,101.66	58.00	3,467.23	35.46	122,936.35
1989	517,873.08	58.00	8,928.74	36.15	322,814.19
1990	252,058.91	58.00	4,345.79	36.86	160,176.63
1991	370,363.52	58.00	6,385.50	37.57	239,875.93
1992	387,302.31	58.00	6,677.55	38.28	255,619.99
1993	252,972.05	58.00	4,361.54	39.00	170,101.47
1994	296,164.50	58.00	5,106.23	39.72	202,838.52
1995	345,445.87	58.00	5,955.89	40.45	240,940.16
1996	245,177.41	58.00	4,227.15	41.19	174,111.67
1997	495,391.19	58.00	8,541.13	41.93	358,114.32
1998	604,080.70	58.00	10,415.06	42.67	444,420.36
1999	567,668.50	58.00	9,787.27	43.42	424,958.46
2000	684,265.61	58.00	11,797.55	44.17	521,122.94

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Electric Division

355.00 Poles and Fixtures

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2017

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 58 **Survivor Curve: R1.5**

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
2001	489,033.15	58.00	8,431.51	44.93	378,817.73
2002	479,709.94	58.00	8,270.76	45.69	377,881.68
2003	837,143.29	58.00	14,433.34	46.45	670,487.79
2004	879,415.92	58.00	15,162.17	47.22	716,007.65
2005	852,922.58	58.00	14,705.39	48.00	705,791.45
2006	1,605,451.34	58.00	27,679.87	48.77	1,350,033.70
2007	1,219,926.57	58.00	21,032.97	49.55	1,042,282.44
2008	1,162,562.79	58.00	20,043.95	50.34	1,009,015.64
2009	2,068,099.27	58.00	35,656.47	51.13	1,823,071.32
2010	2,443,864.29	58.00	42,135.10	51.92	2,187,763.85
2011	1,996,668.58	58.00	34,424.92	52.72	1,814,891.66
2012	3,683,398.15	58.00	63,506.13	53.52	3,398,963.18
2013	3,637,244.98	58.00	62,710.39	54.33	3,406,848.18
2014	2,421,734.83	58.00	41,753.56	55.14	2,302,144.28
2015	3,053,867.20	58.00	52,652.27	55.95	2,945,898.06
2016	4,485,341.83	58.00	77,332.58	56.77	4,389,909.26
2017	6,091,098.26	58.00	105,017.71	57.59	6,047,801.09
Total	45,696,231.79	58.00	787,856.90	50.40	39,704,485.84

Composite Average Remaining Life ... 50.40 Years

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Electric Division
362.00 Station Equipment

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 52 *Survivor Curve:* R1.5

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1919	38,473.06	52.00	739.86	2.02	1,495.27
1921	3,454.03	52.00	66.42	2.70	179.24
1922	44,192.80	52.00	849.85	3.01	2,558.58
1923	18,915.23	52.00	363.75	3.30	1,199.78
1924	70,346.41	52.00	1,352.80	3.56	4,817.91
1925	173,407.02	52.00	3,334.71	3.81	12,689.56
1926	515,099.34	52.00	9,905.63	4.04	39,985.59
1927	241,190.87	52.00	4,638.22	4.26	19,765.76
1928	92,764.35	52.00	1,783.91	4.48	7,999.96
1929	217,610.38	52.00	4,184.76	4.71	19,706.67
1930	341,614.65	52.00	6,569.43	4.94	32,437.29
1931	434,903.26	52.00	8,363.41	5.17	43,249.27
1932	169,068.50	52.00	3,251.27	5.41	17,591.85
1933	146,532.65	52.00	2,817.90	5.66	15,960.23
1934	77,905.39	52.00	1,498.16	5.91	8,858.16
1935	83,448.46	52.00	1,604.76	6.17	9,898.13
1936	89,708.64	52.00	1,725.14	6.43	11,091.49
1937	88,378.23	52.00	1,699.56	6.70	11,380.47
1938	191,697.22	52.00	3,686.44	6.97	25,687.16
1939	456,378.82	52.00	8,776.40	7.24	63,581.42
1940	239,928.09	52.00	4,613.94	7.53	34,722.48
1941	235,879.41	52.00	4,536.08	7.81	35,430.17
1942	528,015.78	52.00	10,154.02	8.10	82,247.95
1943	254,671.84	52.00	4,897.47	8.39	41,106.76
1944	135,093.91	52.00	2,597.93	8.69	22,578.88
1945	181,207.26	52.00	3,484.71	8.99	31,338.63
1946	287,555.28	52.00	5,529.84	9.30	51,426.94

PGE
Electric Division
362.00 Station Equipment

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 52 *Survivor Curve:* R1.5

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1947	336,751.30	52.00	6,475.90	9.61	62,258.84
1948	1,158,877.70	52.00	22,285.81	9.93	221,299.77
1949	1,422,467.12	52.00	27,354.78	10.25	280,443.59
1950	1,812,760.58	52.00	34,860.32	10.58	368,834.37
1951	3,144,929.30	52.00	60,478.61	10.92	660,139.55
1952	3,246,330.53	52.00	62,428.61	11.26	702,770.49
1953	4,540,682.31	52.00	87,319.66	11.61	1,013,477.77
1954	4,078,554.43	52.00	78,432.70	11.96	938,340.77
1955	2,643,199.84	52.00	50,830.09	12.33	626,677.83
1956	2,517,183.30	52.00	48,406.73	12.70	614,888.93
1957	3,051,425.71	52.00	58,680.49	13.08	767,831.59
1958	2,115,415.95	52.00	40,680.54	13.48	548,225.61
1959	1,291,640.41	52.00	24,838.91	13.88	344,686.44
1960	2,508,592.63	52.00	48,241.53	14.29	689,218.42
1961	3,916,882.30	52.00	75,323.66	14.71	1,107,745.06
1962	3,240,736.07	52.00	62,321.02	15.14	943,286.79
1963	3,033,246.75	52.00	58,330.90	15.58	908,522.65
1964	6,588,208.94	52.00	126,694.65	16.02	2,030,247.89
1965	5,561,274.73	52.00	106,946.18	16.48	1,762,922.82
1966	4,755,317.51	52.00	91,447.20	16.95	1,550,375.25
1967	4,566,433.32	52.00	87,814.86	17.43	1,530,916.92
1968	6,953,823.22	52.00	133,725.60	17.92	2,396,796.73
1969	7,585,814.33	52.00	145,879.12	18.42	2,687,546.46
1970	4,500,895.25	52.00	86,554.53	18.93	1,638,736.33
1971	12,182,290.48	52.00	234,271.72	19.45	4,557,250.76
1972	9,151,131.33	52.00	175,980.97	19.98	3,516,553.95
1973	10,298,359.46	52.00	198,042.76	20.52	4,063,998.59

PGE

Electric Division

362.00 Station Equipment

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2017

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 52 **Survivor Curve: R1.5**

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1974	14,410,429.33	52.00	277,119.98	21.07	5,839,008.44
1975	21,256,208.25	52.00	408,767.83	21.63	8,841,409.10
1976	17,158,500.62	52.00	329,966.80	22.20	7,324,588.67
1977	13,028,803.30	52.00	250,550.60	22.78	5,706,493.97
1978	6,881,210.72	52.00	132,329.23	23.36	3,091,588.22
1979	8,766,338.01	52.00	168,581.19	23.96	4,039,022.12
1980	12,994,115.65	52.00	249,883.54	24.56	6,138,097.71
1981	10,027,981.40	52.00	192,843.25	25.18	4,855,303.10
1982	4,282,527.36	52.00	82,355.21	25.80	2,124,733.15
1983	3,431,873.70	52.00	65,996.70	26.43	1,744,302.19
1984	6,979,242.99	52.00	134,214.44	27.07	3,633,030.01
1985	22,227,864.62	52.00	427,453.28	27.71	11,846,438.70
1986	29,244,432.50	52.00	562,385.50	28.37	15,954,222.22
1987	22,785,953.04	52.00	438,185.61	29.03	12,721,085.37
1988	16,529,689.61	52.00	317,874.44	29.70	9,441,228.86
1989	40,132,001.67	52.00	771,759.06	30.38	23,444,645.25
1990	34,315,838.37	52.00	659,911.24	31.06	20,498,348.82
1991	41,894,507.37	52.00	805,652.95	31.75	25,582,043.29
1992	37,516,564.29	52.00	721,462.85	32.45	23,411,971.31
1993	30,625,504.38	52.00	588,944.22	33.15	19,526,220.79
1994	44,875,836.75	52.00	862,985.45	33.86	29,224,786.38
1995	29,125,522.94	52.00	560,098.81	34.58	19,368,709.85
1996	18,940,775.52	52.00	364,240.87	35.30	12,858,726.43
1997	104,521,637.56	52.00	2,010,004.92	36.03	72,421,186.53
1998	104,664,031.60	52.00	2,012,743.23	36.76	73,995,093.62
1999	79,852,630.87	52.00	1,535,607.21	37.50	57,586,087.95
2000	77,395,816.02	52.00	1,488,361.40	38.24	56,920,902.24

PGE

Electric Division

362.00 Station Equipment

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2017

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: **52** *Survivor Curve:* **R1.5**

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
2001	68,369,505.54	52.00	1,314,780.80	38.99	51,266,424.51
2002	49,585,248.70	52.00	953,549.87	39.75	37,899,323.92
2003	54,545,267.57	52.00	1,048,933.58	40.50	42,485,274.53
2004	57,255,225.04	52.00	1,101,047.46	41.27	45,435,498.89
2005	72,794,200.63	52.00	1,399,869.97	42.03	58,840,296.96
2006	94,068,728.14	52.00	1,808,990.09	42.80	77,432,462.46
2007	107,452,021.15	52.00	2,066,357.70	43.58	90,052,624.45
2008	148,935,132.45	52.00	2,864,099.30	44.36	127,054,359.57
2009	187,717,489.80	52.00	3,609,904.00	45.15	162,973,416.17
2010	155,578,414.93	52.00	2,991,853.04	45.94	137,433,395.58
2011	202,237,070.94	52.00	3,889,123.02	46.73	181,735,217.86
2012	274,233,002.85	52.00	5,273,641.87	47.53	250,645,313.32
2013	164,854,581.21	52.00	3,170,238.49	48.33	153,221,495.04
2014	161,805,590.65	52.00	3,111,604.83	49.14	152,900,972.07
2015	207,471,811.73	52.00	3,989,789.78	49.95	199,294,329.37
2016	188,670,075.70	52.00	3,628,222.72	50.77	184,196,273.22
2017	173,027,828.52	52.00	3,327,414.25	51.59	171,656,578.69
Total	3,344,027,699.67	52.00	64,307,374.76	41.98	2,699,845,510.66

Composite Average Remaining Life ... 41.98 Years

PGE
Electric Division
364.00 Poles, Towers, and Fixtures

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: **51** *Survivor Curve:* **R2**

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1953	456,399.12	51.00	8,948.98	8.69	77,793.44
1954	1,300,502.39	51.00	25,499.97	9.03	230,385.28
1955	1,591,255.87	51.00	31,201.01	9.38	292,736.19
1956	1,496,824.79	51.00	29,349.42	9.74	285,826.46
1957	3,183,015.40	51.00	62,411.89	10.10	630,648.07
1958	2,369,900.54	51.00	46,468.50	10.48	487,003.65
1959	2,647,267.13	51.00	51,907.05	10.87	564,030.02
1960	2,532,051.34	51.00	49,647.92	11.26	559,160.73
1961	3,127,240.84	51.00	61,318.27	11.67	715,563.51
1962	3,812,943.25	51.00	74,763.38	12.09	903,726.99
1963	4,089,014.76	51.00	80,176.53	12.52	1,003,587.17
1964	4,538,122.69	51.00	88,982.54	12.96	1,153,035.52
1965	4,620,968.41	51.00	90,606.96	13.41	1,215,065.47
1966	9,283,457.95	51.00	182,028.06	13.87	2,525,491.33
1967	6,527,346.56	51.00	127,986.82	14.35	1,836,579.89
1968	7,830,354.21	51.00	153,535.92	14.84	2,278,017.03
1969	5,649,644.28	51.00	110,777.02	15.34	1,698,878.03
1970	6,092,913.34	51.00	119,468.55	15.85	1,893,181.78
1971	8,204,533.87	51.00	160,872.75	16.37	2,633,330.19
1972	10,686,115.17	51.00	209,531.07	16.90	3,541,693.02
1973	14,247,770.77	51.00	279,367.25	17.45	4,874,507.56
1974	11,234,335.95	51.00	220,280.46	18.01	3,966,200.67
1975	14,020,490.09	51.00	274,910.78	18.57	5,106,022.14
1976	18,693,268.77	51.00	366,533.63	19.15	7,020,107.79
1977	19,621,540.64	51.00	384,734.99	19.74	7,595,842.17
1978	22,364,117.22	51.00	438,510.84	20.34	8,921,191.72
1979	23,483,131.59	51.00	460,452.24	20.96	9,649,358.16

PGE

Electric Division

364.00 Poles, Towers, and Fixtures

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2017

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 51 **Survivor Curve: R2**

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1980	28,706,719.48	51.00	562,875.24	21.58	12,145,171.92
1981	28,613,675.87	51.00	561,050.86	22.21	12,461,049.38
1982	22,895,927.53	51.00	448,938.47	22.85	10,259,855.71
1983	23,969,103.91	51.00	469,981.08	23.51	11,047,858.88
1984	28,988,443.96	51.00	568,399.23	24.17	13,738,396.59
1985	45,007,334.00	51.00	882,494.21	24.84	21,924,090.54
1986	54,570,123.64	51.00	1,069,999.35	25.53	27,312,621.16
1987	49,013,217.38	51.00	961,040.72	26.22	25,196,247.34
1988	47,936,541.77	51.00	939,929.49	26.92	25,301,654.91
1989	45,339,217.80	51.00	889,001.72	27.63	24,561,940.83
1990	61,095,328.02	51.00	1,197,944.17	28.35	33,958,729.02
1991	84,828,847.26	51.00	1,663,305.95	29.07	48,360,600.18
1992	74,141,116.03	51.00	1,453,743.20	29.81	43,337,502.16
1993	64,489,009.71	51.00	1,264,486.75	30.56	38,636,769.01
1994	51,381,319.47	51.00	1,007,473.96	31.31	31,541,796.98
1995	64,554,644.86	51.00	1,265,773.72	32.07	40,591,260.57
1996	101,080,732.00	51.00	1,981,969.45	32.84	65,081,452.91
1997	125,664,886.08	51.00	2,464,010.30	33.61	82,822,565.37
1998	96,702,385.91	51.00	1,896,119.77	34.40	65,220,177.01
1999	74,591,673.11	51.00	1,462,577.63	35.19	51,464,962.47
2000	74,181,093.32	51.00	1,454,527.06	35.99	52,343,121.98
2001	85,584,825.42	51.00	1,678,129.01	36.79	61,741,765.67
2002	87,610,188.66	51.00	1,717,841.90	37.60	64,598,981.74
2003	105,743,378.92	51.00	2,073,393.63	38.42	79,668,770.33
2004	88,793,171.06	51.00	1,741,037.57	39.25	68,336,946.43
2005	81,285,280.55	51.00	1,593,824.45	40.08	63,884,504.16
2006	104,103,952.76	51.00	2,041,248.11	40.92	83,532,288.73

PGE
Electric Division
364.00 Poles, Towers, and Fixtures

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 51 *Survivor Curve:* R2

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
2007	93,303,998.69	51.00	1,829,484.92	41.77	76,414,223.76
2008	125,976,385.47	51.00	2,470,118.11	42.62	105,277,322.73
2009	127,711,094.87	51.00	2,504,131.92	43.48	108,876,277.98
2010	165,847,099.72	51.00	3,251,894.58	44.34	144,198,387.38
2011	208,651,853.45	51.00	4,091,201.06	45.21	184,975,157.54
2012	206,039,708.85	51.00	4,039,982.69	46.09	186,197,286.82
2013	251,203,695.32	51.00	4,925,548.51	46.97	231,352,388.70
2014	226,266,812.65	51.00	4,436,591.43	47.86	212,319,755.69
2015	279,571,650.18	51.00	5,481,781.32	48.75	267,227,995.22
2016	210,955,312.13	51.00	4,136,366.79	49.65	205,351,510.35
2017	412,463,187.07	51.00	8,087,490.25	50.55	408,801,175.44
Total	4,322,567,463.82	51.00	84,755,981.37	39.66	3,361,721,527.54

Composite Average Remaining Life ... 39.66 Years

PGE
Electric Division
365.00 Overhead Conductors and Devices

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 52 ***Survivor Curve:*** R2

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1950	320,334.52	52.00	6,160.26	8.29	51,081.37
1951	1,248,824.50	52.00	24,015.76	8.62	206,983.62
1952	1,339,588.39	52.00	25,761.22	8.95	230,627.51
1953	1,750,919.62	52.00	33,671.40	9.29	312,948.49
1954	1,977,697.91	52.00	38,032.51	9.64	366,793.50
1955	1,994,381.00	52.00	38,353.33	10.00	383,650.14
1956	1,959,512.88	52.00	37,682.80	10.37	390,813.01
1957	3,596,835.16	52.00	69,169.64	10.75	743,493.20
1958	2,840,946.68	52.00	54,633.38	11.14	608,426.27
1959	3,094,315.32	52.00	59,505.84	11.53	686,370.33
1960	2,989,323.38	52.00	57,486.77	11.94	686,554.37
1961	3,988,278.14	52.00	76,697.36	12.36	948,135.43
1962	4,484,358.13	52.00	86,237.33	12.79	1,103,174.04
1963	4,373,467.26	52.00	84,104.82	13.23	1,113,024.47
1964	4,743,191.76	52.00	91,214.88	13.69	1,248,418.13
1965	4,225,627.17	52.00	81,261.75	14.15	1,149,913.93
1966	7,835,940.11	52.00	150,690.58	14.63	2,204,055.52
1967	6,147,218.04	52.00	118,215.28	15.11	1,786,641.88
1968	9,766,402.90	52.00	187,814.72	15.61	2,932,169.19
1969	8,021,062.01	52.00	154,250.60	16.12	2,486,837.69
1970	8,920,288.05	52.00	171,543.35	16.64	2,855,082.37
1971	10,008,486.74	52.00	192,470.16	17.18	3,305,926.75
1972	12,742,686.80	52.00	245,050.73	17.72	4,342,395.55
1973	15,429,822.13	52.00	296,726.22	18.27	5,422,407.35
1974	18,617,661.19	52.00	358,030.58	18.84	6,745,587.48
1975	21,997,042.28	52.00	423,018.43	19.42	8,214,373.34
1976	22,371,904.65	52.00	430,227.29	20.01	8,607,540.99

PGE
Electric Division
365.00 Overhead Conductors and Devices

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 52 *Survivor Curve:* R2

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1977	21,046,651.92	52.00	404,741.76	20.61	8,340,163.38
1978	19,911,944.52	52.00	382,920.55	21.22	8,123,982.79
1979	22,883,931.12	52.00	440,073.92	21.84	9,609,423.54
1980	27,102,537.45	52.00	521,200.65	22.47	11,709,415.12
1981	25,839,542.05	52.00	496,912.37	23.11	11,481,949.58
1982	21,012,056.51	52.00	404,076.47	23.76	9,599,577.44
1983	24,637,381.59	52.00	473,793.99	24.42	11,568,530.76
1984	30,030,253.04	52.00	577,502.66	25.09	14,487,409.18
1985	49,291,493.48	52.00	947,909.72	25.76	24,421,344.83
1986	66,395,721.91	52.00	1,276,835.93	26.45	33,774,678.27
1987	55,367,529.73	52.00	1,064,756.12	27.15	28,907,451.69
1988	52,550,210.50	52.00	1,010,577.11	27.86	28,150,374.40
1989	64,642,364.59	52.00	1,243,117.65	28.57	35,516,881.42
1990	67,762,695.88	52.00	1,303,123.79	29.29	38,174,263.96
1991	86,377,981.89	52.00	1,661,108.69	30.03	49,877,169.18
1992	74,382,561.17	52.00	1,430,428.40	30.77	44,009,519.09
1993	62,987,751.58	52.00	1,211,298.29	31.51	38,174,058.54
1994	58,974,238.50	52.00	1,134,115.64	32.27	36,599,336.10
1995	108,650,334.08	52.00	2,089,421.52	33.04	69,024,685.00
1996	101,728,907.83	52.00	1,956,317.68	33.81	66,137,265.52
1997	141,676,782.21	52.00	2,724,543.10	34.59	94,231,702.92
1998	110,473,894.98	52.00	2,124,489.87	35.37	75,149,237.56
1999	87,508,943.80	52.00	1,682,857.88	36.17	60,861,387.16
2000	83,589,744.44	52.00	1,607,488.95	36.97	59,423,588.00
2001	91,014,248.50	52.00	1,750,267.32	37.77	66,116,191.41
2002	83,689,600.97	52.00	1,609,409.26	38.59	62,106,986.23
2003	114,163,528.68	52.00	2,195,444.09	39.41	86,526,069.57

PGE

Electric Division

365.00 Overhead Conductors and Devices

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2017

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 52 **Survivor Curve:** R2

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
2004	85,629,519.02	52.00	1,646,715.23	40.24	66,263,730.31
2005	88,292,296.70	52.00	1,697,922.30	41.07	69,741,634.86
2006	124,571,178.78	52.00	2,395,590.44	41.92	100,412,972.11
2007	118,970,093.88	52.00	2,287,877.68	42.76	97,836,528.55
2008	177,509,794.89	52.00	3,413,636.86	43.62	148,890,283.04
2009	169,988,139.12	52.00	3,268,990.19	44.48	145,390,185.70
2010	235,464,715.42	52.00	4,528,150.31	45.34	205,309,132.03
2011	309,145,802.44	52.00	5,945,088.88	46.21	274,724,407.97
2012	299,767,878.75	52.00	5,764,744.88	47.09	271,443,309.65
2013	292,699,643.82	52.00	5,628,817.80	47.97	270,006,783.49
2014	233,615,804.58	52.00	4,492,594.47	48.86	219,489,173.24
2015	223,632,441.85	52.00	4,300,607.46	49.75	213,946,716.99
2016	204,159,060.58	52.00	3,926,120.78	50.65	198,839,437.48
2017	212,558,165.08	52.00	4,087,641.41	51.55	210,707,164.94
Total	4,716,483,484.55	52.00	90,701,259.03	40.07	3,634,237,528.94

Composite Average Remaining Life ... 40.07 Years

PGE
Electric Division
366.00 Underground Conduit

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 70 *Survivor Curve:* R4

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1923	4,064.89	70.00	58.07	2.66	154.67
1924	52,904.53	70.00	755.78	2.92	2,207.11
1925	178,726.57	70.00	2,553.22	3.14	8,022.71
1926	184,902.01	70.00	2,641.44	3.40	8,993.52
1927	88,140.85	70.00	1,259.15	3.64	4,588.85
1928	122,564.38	70.00	1,750.91	3.91	6,846.54
1929	248,916.91	70.00	3,555.94	4.16	14,800.93
1930	183,669.40	70.00	2,623.84	4.43	11,625.37
1931	241,150.53	70.00	3,444.99	4.71	16,211.01
1932	108,735.73	70.00	1,553.36	4.96	7,707.12
1933	59,972.58	70.00	856.75	5.24	4,490.21
1934	58,645.64	70.00	837.79	5.51	4,615.89
1935	64,652.53	70.00	923.60	5.80	5,353.10
1936	38,013.65	70.00	543.05	6.08	3,301.25
1937	48,562.69	70.00	693.75	6.38	4,423.61
1938	169,955.40	70.00	2,427.92	6.68	16,227.48
1939	81,426.77	70.00	1,163.23	6.99	8,131.51
1940	233,979.51	70.00	3,342.55	7.32	24,456.11
1941	108,916.97	70.00	1,555.95	7.65	11,903.45
1942	183,023.66	70.00	2,614.61	8.00	20,921.24
1943	227,340.98	70.00	3,247.71	8.37	27,174.23
1944	66,623.99	70.00	951.77	8.75	8,328.38
1945	59,758.01	70.00	853.68	9.15	7,812.28
1946	62,839.45	70.00	897.70	9.57	8,594.94
1947	52,547.87	70.00	750.68	10.02	7,518.49
1948	538,756.53	70.00	7,696.48	10.48	80,683.50
1949	623,761.67	70.00	8,910.84	10.97	97,746.23

PGE
Electric Division
366.00 Underground Conduit

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 70 **Survivor Curve: R4**

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1950	386,556.62	70.00	5,522.21	11.48	63,413.54
1951	419,538.23	70.00	5,993.37	12.02	72,021.67
1952	1,286,713.83	70.00	18,381.54	12.57	231,078.88
1953	1,577,576.57	70.00	22,536.70	13.16	296,511.82
1954	1,374,610.66	70.00	19,637.20	13.76	270,116.07
1955	1,010,644.04	70.00	14,437.70	14.38	207,610.67
1956	1,345,068.52	70.00	19,215.17	15.02	288,527.70
1957	1,268,404.59	70.00	18,119.98	15.67	283,950.25
1958	1,345,351.99	70.00	19,219.22	16.33	313,944.76
1959	791,553.24	70.00	11,307.85	17.01	192,334.85
1960	710,294.61	70.00	10,147.02	17.70	179,586.40
1961	1,070,485.65	70.00	15,292.58	18.39	281,267.08
1962	714,037.72	70.00	10,200.49	19.10	194,833.33
1963	794,774.41	70.00	11,353.87	19.81	224,973.24
1964	2,140,594.30	70.00	30,579.77	20.54	628,185.21
1965	1,480,770.43	70.00	21,153.76	21.28	450,114.40
1966	3,709,852.61	70.00	52,997.64	22.02	1,167,178.71
1967	4,920,712.79	70.00	70,295.56	22.78	1,601,649.13
1968	7,021,249.82	70.00	100,303.08	23.55	2,362,301.63
1969	6,099,996.41	70.00	87,142.38	24.33	2,120,506.56
1970	9,195,004.94	70.00	131,356.58	25.12	3,300,080.14
1971	11,625,863.38	70.00	166,082.96	25.93	4,305,860.03
1972	15,301,953.41	70.00	218,598.28	26.74	5,844,650.90
1973	16,387,707.34	70.00	234,108.97	27.56	6,451,363.99
1974	20,768,051.20	70.00	296,685.01	28.39	8,423,555.03
1975	19,739,708.93	70.00	281,994.48	29.23	8,243,566.55
1976	16,077,471.34	70.00	229,677.05	30.09	6,910,327.84

PGE
Electric Division
366.00 Underground Conduit

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 70 **Survivor Curve:** R4

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1977	17,395,034.03	70.00	248,499.29	30.95	7,690,462.45
1978	14,613,318.80	70.00	208,760.69	31.82	6,642,679.60
1979	19,521,999.54	70.00	278,884.36	32.70	9,119,088.34
1980	22,159,068.15	70.00	316,556.59	33.58	10,631,527.59
1981	31,507,321.75	70.00	450,102.42	34.48	15,520,938.17
1982	20,415,089.24	70.00	291,642.72	35.39	10,320,059.18
1983	14,272,910.00	70.00	203,897.73	36.30	7,401,235.48
1984	18,062,565.86	70.00	258,035.41	37.22	9,603,170.20
1985	27,857,416.86	70.00	397,961.18	38.14	15,179,240.52
1986	36,541,671.04	70.00	522,021.35	39.07	20,397,238.60
1987	48,009,867.60	70.00	685,851.94	40.01	27,440,929.95
1988	53,849,071.16	70.00	769,268.73	40.95	31,504,909.80
1989	76,864,794.51	70.00	1,098,063.19	41.90	46,010,966.28
1990	82,726,877.36	70.00	1,181,806.82	42.86	50,647,465.25
1991	76,056,173.15	70.00	1,086,511.51	43.81	47,603,550.18
1992	60,047,904.68	70.00	857,823.06	44.78	38,409,567.80
1993	49,883,361.33	70.00	712,616.00	45.74	32,595,889.88
1994	88,923,530.00	70.00	1,270,330.00	46.71	59,337,098.14
1995	33,614,754.67	70.00	480,208.46	47.68	22,897,965.58
1996	60,778,253.41	70.00	868,256.57	48.66	42,248,226.08
1997	100,223,389.15	70.00	1,431,755.78	49.64	71,068,882.66
1998	117,056,669.54	70.00	1,672,230.06	50.62	84,645,356.58
1999	106,651,127.19	70.00	1,523,580.17	51.60	78,619,303.58
2000	94,317,058.24	70.00	1,347,380.04	52.59	70,854,368.36
2001	73,038,084.41	70.00	1,043,396.16	53.57	55,898,420.58
2002	54,917,698.65	70.00	784,534.76	54.56	42,806,243.95
2003	79,174,095.63	70.00	1,131,053.04	55.55	62,832,896.05

PGE
Electric Division
366.00 Underground Conduit

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: **70** *Survivor Curve:* **R4**

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
2004	66,440,061.32	70.00	949,139.15	56.54	53,668,358.38
2005	84,037,512.28	70.00	1,200,530.09	57.54	69,074,627.27
2006	110,028,684.31	70.00	1,571,830.75	58.53	92,000,108.79
2007	93,974,099.92	70.00	1,342,480.65	59.53	79,911,209.67
2008	72,910,027.42	70.00	1,041,566.79	60.52	63,035,909.81
2009	66,349,691.68	70.00	947,848.16	61.52	58,308,263.40
2010	102,223,241.35	70.00	1,460,324.96	62.51	91,289,336.14
2011	84,317,016.65	70.00	1,204,522.99	63.51	76,499,587.70
2012	97,271,021.75	70.00	1,389,579.31	64.51	89,638,778.91
2013	114,637,083.02	70.00	1,637,664.70	65.51	107,276,695.85
2014	94,902,644.62	70.00	1,355,745.51	66.50	90,162,786.77
2015	80,190,182.59	70.00	1,145,568.50	67.50	77,329,071.18
2016	82,602,561.22	70.00	1,180,030.89	68.50	80,834,114.41
2017	80,342,415.39	70.00	1,147,743.25	69.50	79,768,984.81
Total	2,861,362,450.75	70.00	40,876,408.92	52.40	2,142,057,864.01

Composite Average Remaining Life ... 52.40 Years

PGE
Electric Division
367.00 Underground Conductors and Devices

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 54 **Survivor Curve: R3**

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1959	27,331.54	54.00	506.14	8.96	4,534.99
1960	114,535.88	54.00	2,121.03	9.36	19,853.95
1961	264,884.73	54.00	4,905.27	9.78	47,958.97
1962	329,526.65	54.00	6,102.34	10.21	62,315.12
1963	372,453.73	54.00	6,897.29	10.66	73,551.92
1964	948,949.33	54.00	17,573.13	11.13	195,654.85
1965	1,018,162.47	54.00	18,854.85	11.62	219,117.00
1966	2,548,564.55	54.00	47,195.63	12.13	572,309.17
1967	2,636,937.90	54.00	48,832.17	12.65	617,540.54
1968	5,795,534.06	54.00	107,324.67	13.19	1,415,270.57
1969	4,536,029.29	54.00	84,000.52	13.74	1,154,537.20
1970	7,505,147.67	54.00	138,984.17	14.32	1,990,057.71
1971	9,453,609.92	54.00	175,066.80	14.91	2,610,066.45
1972	11,643,872.88	54.00	215,627.21	15.52	3,345,481.99
1973	12,790,734.19	54.00	236,865.38	16.14	3,822,194.81
1974	15,920,205.77	54.00	294,818.54	16.77	4,944,179.87
1975	18,756,616.40	54.00	347,344.64	17.42	6,051,420.31
1976	22,745,366.84	54.00	421,210.37	18.09	7,618,614.95
1977	23,833,028.67	54.00	441,352.25	18.77	8,282,519.55
1978	21,808,333.45	54.00	403,857.90	19.46	7,858,222.76
1979	33,972,198.34	54.00	629,114.59	20.16	12,684,192.44
1980	43,108,424.48	54.00	798,303.91	20.88	16,667,052.22
1981	44,069,389.39	54.00	816,099.56	21.60	17,630,865.36
1982	31,397,976.37	54.00	581,443.83	22.34	12,991,626.95
1983	28,448,626.45	54.00	526,826.26	23.09	12,166,811.51
1984	38,662,177.09	54.00	715,966.02	23.86	17,080,058.94
1985	86,558,927.34	54.00	1,602,942.61	24.63	39,476,846.62

PGE
Electric Division
367.00 Underground Conductors and Devices

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 54 **Survivor Curve:** R3

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1986	77,472,380.42	54.00	1,434,673.28	25.41	36,454,508.91
1987	97,404,189.83	54.00	1,803,780.74	26.20	47,261,612.28
1988	93,556,893.13	54.00	1,732,534.53	27.00	46,780,888.03
1989	131,114,923.89	54.00	2,428,053.41	27.81	67,531,720.41
1990	122,953,167.82	54.00	2,276,909.82	28.63	65,197,197.55
1991	122,810,758.20	54.00	2,274,272.61	29.46	67,009,456.73
1992	89,313,570.58	54.00	1,653,954.51	30.30	50,119,953.61
1993	75,382,789.64	54.00	1,395,977.16	31.15	43,485,836.15
1994	82,879,261.90	54.00	1,534,800.68	32.01	49,122,028.01
1995	34,962,136.37	54.00	647,446.77	32.87	21,282,038.16
1996	79,715,058.35	54.00	1,476,204.34	33.74	49,813,137.18
1997	126,994,445.48	54.00	2,351,748.28	34.63	81,430,025.09
1998	115,459,328.87	54.00	2,138,135.07	35.51	75,934,251.52
1999	104,181,039.34	54.00	1,929,277.92	36.41	70,246,195.41
2000	102,229,893.03	54.00	1,893,145.59	37.31	70,641,190.07
2001	92,369,187.81	54.00	1,710,539.99	38.22	65,382,972.90
2002	87,228,349.34	54.00	1,615,339.31	39.14	63,226,367.68
2003	99,814,332.60	54.00	1,848,413.00	40.07	74,057,079.81
2004	89,665,114.07	54.00	1,660,464.57	41.00	68,071,221.44
2005	115,844,780.58	54.00	2,145,273.06	41.93	89,953,742.00
2006	135,433,780.65	54.00	2,508,032.21	42.87	107,525,576.16
2007	140,407,185.74	54.00	2,600,132.28	43.82	113,935,284.00
2008	126,447,106.11	54.00	2,341,612.36	44.77	104,833,565.25
2009	117,182,320.93	54.00	2,170,042.32	45.73	99,227,743.56
2010	184,125,799.22	54.00	3,409,735.99	46.69	159,189,707.31
2011	171,152,591.33	54.00	3,169,491.47	47.65	151,030,839.85
2012	208,842,545.87	54.00	3,867,453.38	48.62	188,034,694.89

PGE
Electric Division
367.00 Underground Conductors and Devices

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 54 **Survivor Curve:** R3

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
2013	268,013,145.20	54.00	4,963,204.88	49.59	246,132,941.98
2014	221,641,992.13	54.00	4,104,480.09	50.57	207,549,045.32
2015	175,058,189.31	54.00	3,241,817.33	51.54	167,096,134.41
2016	179,346,494.39	54.00	3,321,230.37	52.52	174,446,364.00
2017	216,018,022.26	54.00	4,000,332.53	53.51	214,048,461.80
Total	4,554,288,319.77	54.00	84,338,646.95	39.31	3,315,654,638.16

Composite Average Remaining Life ... 39.31 Years

PGE
Electric Division
368.01 Line Transformers - Overhead

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 34 *Survivor Curve:* R2.5

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1963	129,152.27	34.00	3,798.58	2.29	8,717.46
1964	222,647.22	34.00	6,548.42	2.52	16,525.29
1965	341,448.61	34.00	10,042.56	2.74	27,550.29
1966	577,296.71	34.00	16,979.23	2.96	50,254.75
1967	697,824.55	34.00	20,524.15	3.18	65,328.23
1968	975,468.30	34.00	28,690.11	3.40	97,544.69
1969	1,204,158.43	34.00	35,416.26	3.62	128,276.78
1970	1,395,485.13	34.00	41,043.48	3.85	157,990.56
1971	1,665,661.81	34.00	48,989.82	4.08	199,993.04
1972	1,815,210.15	34.00	53,388.28	4.32	230,723.10
1973	2,469,669.55	34.00	72,636.99	4.57	331,830.19
1974	3,258,222.62	34.00	95,829.62	4.82	462,307.31
1975	3,078,672.26	34.00	90,548.75	5.09	461,032.70
1976	4,376,240.94	34.00	128,712.36	5.37	691,515.07
1977	7,120,797.74	34.00	209,434.23	5.67	1,187,444.06
1978	9,759,491.06	34.00	287,042.49	5.99	1,718,090.72
1979	9,498,613.61	34.00	279,369.66	6.32	1,766,125.62
1980	10,760,894.91	34.00	316,495.40	6.68	2,114,357.62
1981	13,203,270.29	34.00	388,329.63	7.06	2,742,782.02
1982	11,859,315.39	34.00	348,801.73	7.47	2,605,663.67
1983	16,908,968.87	34.00	497,320.24	7.90	3,930,363.29
1984	23,683,533.92	34.00	696,571.21	8.36	5,823,661.31
1985	31,006,249.41	34.00	911,944.17	8.84	8,065,924.60
1986	26,332,067.51	34.00	774,468.88	9.35	7,244,726.74
1987	19,356,499.44	34.00	569,306.09	9.89	5,629,817.71
1988	22,912,707.37	34.00	673,899.95	10.45	7,040,459.83
1989	27,604,206.83	34.00	811,884.57	11.03	8,954,095.05

PGE
Electric Division
368.01 Line Transformers - Overhead

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 34 **Survivor Curve:** R2.5

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1990	29,108,414.00	34.00	856,125.74	11.63	9,958,633.37
1991	28,075,926.78	34.00	825,758.62	12.26	10,120,970.16
1992	19,902,156.49	34.00	585,354.75	12.90	7,551,555.05
1993	14,459,628.29	34.00	425,281.16	13.56	5,768,492.34
1994	29,713,904.68	34.00	873,934.21	14.25	12,449,227.59
1995	38,190,110.90	34.00	1,123,233.20	14.94	16,784,747.85
1996	32,929,690.66	34.00	968,515.70	15.66	15,164,835.29
1997	31,148,162.28	34.00	916,118.05	16.39	15,013,407.56
1998	31,769,796.88	34.00	934,401.34	17.13	16,009,503.62
1999	39,594,064.55	34.00	1,164,525.76	17.89	20,837,284.35
2000	49,070,138.96	34.00	1,443,232.50	18.67	26,941,362.85
2001	40,789,684.53	34.00	1,199,690.89	19.45	23,338,755.52
2002	44,364,745.25	34.00	1,304,839.23	20.26	26,429,535.79
2003	52,578,548.03	34.00	1,546,420.51	21.07	32,581,194.70
2004	50,341,834.11	34.00	1,480,635.12	21.89	32,418,249.43
2005	56,730,238.71	34.00	1,668,528.48	22.73	37,930,150.81
2006	78,092,561.02	34.00	2,296,829.08	23.58	54,163,652.85
2007	82,902,018.81	34.00	2,438,283.05	24.44	59,596,578.67
2008	91,411,301.83	34.00	2,688,554.89	25.31	68,054,050.96
2009	98,692,386.72	34.00	2,902,703.42	26.19	76,030,033.93
2010	160,655,690.68	34.00	4,725,144.85	27.08	127,968,767.51
2011	159,124,581.28	34.00	4,680,112.44	27.98	130,954,158.79
2012	170,142,410.48	34.00	5,004,164.69	28.89	144,559,084.33
2013	180,192,524.31	34.00	5,299,754.87	29.80	157,944,785.39
2014	188,238,014.45	34.00	5,536,385.80	30.72	170,100,237.07
2015	208,566,287.29	34.00	6,134,273.33	31.65	194,165,556.49
2016	191,065,606.44	34.00	5,619,549.88	32.59	183,126,269.26

PGE

Electric Division

368.01 Line Transformers - Overhead

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2017

Based Upon Broad Group/Remaining Life Procedure and Technique

***Average Service Life:* 34** ***Survivor Curve:* R2.5**

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
2017	173,628,688.95	34.00	5,106,701.81	33.53	171,217,154.09
Total	2,623,692,892.26	34.00	77,167,070.23	24.74	1,908,931,337.31

Composite Average Remaining Life ... 24.74 Years

PGE
Electric Division
369.01 Services - Overhead

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 59 *Survivor Curve:* R2.5

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1941	1,520.64	59.00	25.77	8.10	208.72
1942	27,962.03	59.00	473.93	8.35	3,959.15
1943	14,597.50	59.00	247.41	8.62	2,132.18
1944	30,250.48	59.00	512.72	8.89	4,560.33
1945	60,248.23	59.00	1,021.15	9.17	9,366.35
1946	133,253.60	59.00	2,258.53	9.46	21,367.11
1947	260,133.45	59.00	4,409.03	9.76	43,030.61
1948	333,799.50	59.00	5,657.60	10.07	56,975.81
1949	369,469.63	59.00	6,262.18	10.39	65,068.23
1950	414,961.20	59.00	7,033.22	10.72	75,419.11
1951	488,507.75	59.00	8,279.77	11.07	91,649.86
1952	491,129.82	59.00	8,324.21	11.43	95,121.15
1953	348,624.82	59.00	5,908.88	11.80	69,718.19
1954	687,302.43	59.00	11,649.16	12.18	141,937.37
1955	812,349.58	59.00	13,768.60	12.58	173,271.26
1956	970,194.31	59.00	16,443.93	13.00	213,759.81
1957	1,151,994.10	59.00	19,525.27	13.43	262,171.15
1958	1,185,666.98	59.00	20,096.00	13.87	278,771.85
1959	1,421,505.46	59.00	24,093.25	14.33	345,291.09
1960	1,521,887.85	59.00	25,794.64	14.81	381,899.54
1961	1,580,314.32	59.00	26,784.92	15.29	409,608.40
1962	1,664,102.90	59.00	28,205.06	15.80	445,539.46
1963	1,755,480.68	59.00	29,753.83	16.31	485,414.63
1964	1,998,782.99	59.00	33,877.59	16.84	570,642.43
1965	2,082,769.37	59.00	35,301.08	17.39	613,923.58
1966	2,470,527.50	59.00	41,873.24	17.95	751,667.30
1967	2,826,955.32	59.00	47,914.37	18.52	887,445.13

PGE

Electric Division

369.01 Services - Overhead

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2017

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 59 **Survivor Curve: R2.5**

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1968	3,017,134.48	59.00	51,137.74	19.11	977,169.61
1969	3,463,372.86	59.00	58,701.08	19.71	1,156,867.33
1970	3,574,288.93	59.00	60,581.01	20.32	1,230,761.49
1971	3,810,134.89	59.00	64,578.39	20.94	1,352,286.43
1972	3,990,305.23	59.00	67,632.11	21.58	1,459,197.43
1973	4,622,015.30	59.00	78,339.03	22.22	1,740,812.01
1974	5,811,916.45	59.00	98,506.80	22.88	2,253,493.72
1975	7,458,948.40	59.00	126,422.52	23.54	2,976,597.05
1976	7,712,793.38	59.00	130,724.96	24.22	3,166,540.03
1977	7,582,557.28	59.00	128,517.58	24.91	3,201,215.93
1978	8,505,141.99	59.00	144,154.57	25.61	3,691,417.99
1979	8,583,440.05	59.00	145,481.65	26.31	3,828,340.87
1980	9,574,321.95	59.00	162,276.21	27.03	4,386,205.34
1981	9,816,197.91	59.00	166,375.79	27.76	4,617,899.77
1982	9,056,311.51	59.00	153,496.40	28.49	4,373,231.68
1983	9,143,566.53	59.00	154,975.29	29.23	4,530,538.48
1984	10,881,063.52	59.00	184,424.32	29.98	5,529,824.29
1985	17,179,706.84	59.00	291,180.70	30.74	8,952,293.33
1986	19,039,500.81	59.00	322,702.55	31.51	10,169,353.34
1987	17,160,075.06	59.00	290,847.96	32.29	9,390,828.99
1988	20,567,987.34	59.00	348,609.03	33.07	11,529,356.98
1989	22,580,503.77	59.00	382,719.39	33.86	12,960,580.39
1990	21,897,093.64	59.00	371,136.19	34.66	12,864,384.08
1991	25,789,166.78	59.00	437,103.36	35.47	15,503,900.46
1992	26,486,016.95	59.00	448,914.35	36.28	16,288,409.12
1993	38,488,268.76	59.00	652,341.80	37.10	24,204,141.60
1994	14,731,025.44	59.00	249,677.73	37.93	9,470,878.02

PGE
Electric Division
369.01 Services - Overhead

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 59 **Survivor Curve: R2.5**

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1995	10,412,193.69	59.00	176,477.39	38.77	6,841,638.15
1996	5,103,184.82	59.00	86,494.43	39.61	3,426,001.72
1997	3,213,085.26	59.00	54,458.93	40.46	2,203,225.99
1998	21,083,819.28	59.00	357,351.92	41.31	14,762,798.72
1999	22,484,698.87	59.00	381,095.58	42.17	16,071,761.93
2000	16,161,187.17	59.00	273,917.70	43.04	11,788,919.74
2001	16,987,198.91	59.00	287,917.86	43.91	12,642,847.71
2002	20,846,695.27	59.00	353,332.88	44.79	15,825,710.01
2003	22,579,724.62	59.00	382,706.18	45.67	17,479,143.03
2004	19,504,819.28	59.00	330,589.28	46.56	15,392,951.95
2005	16,399,933.86	59.00	277,964.24	47.46	13,191,274.35
2006	22,111,328.30	59.00	374,767.28	48.36	18,122,263.42
2007	19,499,595.15	59.00	330,500.73	49.26	16,280,313.80
2008	33,239,388.53	59.00	563,377.97	50.17	28,263,870.18
2009	24,630,516.93	59.00	417,465.28	51.08	21,324,902.36
2010	32,462,495.74	59.00	550,210.33	52.00	28,610,221.70
2011	25,433,639.84	59.00	431,077.50	52.92	22,812,900.36
2012	24,144,837.29	59.00	409,233.44	53.85	22,035,721.15
2013	27,144,055.73	59.00	460,067.52	54.78	25,200,219.26
2014	28,762,234.40	59.00	487,494.20	55.71	27,157,509.09
2015	35,777,680.05	59.00	606,399.74	56.64	34,349,508.31
2016	46,375,603.71	59.00	786,025.09	57.58	45,262,570.83
2017	39,987,662.01	59.00	677,755.18	58.53	39,667,269.98
Total	899,972,727.20	59.00	15,253,734.48	42.42	647,019,989.33

Composite Average Remaining Life ... 42.42 Years

PGE
Electric Division
369.02 Services - Underground

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 53 *Survivor Curve:* R4

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1953	61,420.25	53.00	1,158.86	3.83	4,442.93
1954	23,122.63	53.00	436.27	4.10	1,790.77
1955	40,383.34	53.00	761.94	4.38	3,339.55
1956	49,673.75	53.00	937.23	4.67	4,376.74
1957	75,069.95	53.00	1,416.40	4.97	7,035.51
1958	95,795.95	53.00	1,807.45	5.28	9,537.81
1959	110,552.49	53.00	2,085.87	5.60	11,683.89
1960	130,251.64	53.00	2,457.55	5.94	14,605.58
1961	127,281.42	53.00	2,401.51	6.31	15,141.77
1962	144,688.00	53.00	2,729.93	6.69	18,257.58
1963	234,902.97	53.00	4,432.08	7.10	31,451.17
1964	252,424.81	53.00	4,762.68	7.53	35,873.32
1965	354,881.83	53.00	6,695.81	8.00	53,549.08
1966	1,096,732.40	53.00	20,692.84	8.49	175,747.05
1967	688,498.45	53.00	12,990.39	9.02	117,171.28
1968	2,681,490.36	53.00	50,593.60	9.58	484,539.68
1969	4,630,204.68	53.00	87,361.39	10.16	887,488.47
1970	4,966,684.63	53.00	93,710.00	10.77	1,009,588.62
1971	7,234,888.71	53.00	136,505.84	11.41	1,557,707.98
1972	8,715,172.22	53.00	164,435.41	12.07	1,984,428.65
1973	9,764,960.56	53.00	184,242.52	12.74	2,347,338.98
1974	11,826,599.04	53.00	223,140.93	13.43	2,995,887.18
1975	12,762,681.41	53.00	240,802.67	14.12	3,401,105.83
1976	15,427,596.55	53.00	291,083.53	14.84	4,318,253.85
1977	19,509,593.77	53.00	368,101.50	15.56	5,727,542.32
1978	23,742,412.91	53.00	447,965.14	16.30	7,299,727.91
1979	27,757,723.24	53.00	523,724.88	17.05	8,928,852.66

PGE
Electric Division
369.02 Services - Underground

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 53 **Survivor Curve:** R4

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1980	31,117,728.90	53.00	587,120.52	17.82	10,460,355.00
1981	30,048,124.95	53.00	566,939.53	18.60	10,544,034.80
1982	23,793,650.55	53.00	448,931.88	19.39	8,706,603.60
1983	27,059,800.22	53.00	510,556.67	20.20	10,315,195.93
1984	35,981,136.87	53.00	678,881.93	21.03	14,275,011.87
1985	47,535,164.87	53.00	896,880.06	21.86	19,609,343.71
1986	56,998,029.31	53.00	1,075,422.72	22.71	24,426,688.61
1987	57,057,595.02	53.00	1,076,546.59	23.57	25,378,058.13
1988	64,386,313.36	53.00	1,214,822.77	24.45	29,700,307.04
1989	100,297,215.02	53.00	1,892,379.52	25.33	47,942,007.73
1990	53,744,607.34	53.00	1,014,038.07	26.23	26,599,167.71
1991	71,789,619.92	53.00	1,354,506.27	27.14	36,758,237.71
1992	63,182,789.77	53.00	1,192,115.03	28.05	33,443,631.59
1993	57,815,548.78	53.00	1,090,847.44	28.98	31,611,867.83
1994	44,172,955.87	53.00	833,442.85	29.91	24,930,412.20
1995	47,547,595.92	53.00	897,114.61	30.85	27,679,167.10
1996	41,216,997.20	53.00	777,670.66	31.80	24,730,352.67
1997	49,220,536.37	53.00	928,679.18	32.76	30,419,116.95
1998	54,770,760.50	53.00	1,033,399.24	33.72	34,841,757.17
1999	69,502,827.84	53.00	1,311,359.72	34.68	45,479,635.43
2000	71,579,226.49	53.00	1,350,536.63	35.65	48,148,711.23
2001	67,151,768.65	53.00	1,267,000.60	36.63	46,405,110.60
2002	62,230,222.57	53.00	1,174,142.26	37.60	44,152,522.31
2003	70,388,843.20	53.00	1,328,076.81	38.59	51,244,417.24
2004	64,031,994.26	53.00	1,208,137.58	39.57	47,805,603.09
2005	68,200,452.95	53.00	1,286,786.88	40.56	52,187,064.04
2006	75,238,480.68	53.00	1,419,578.40	41.55	58,976,568.00

PGE

Electric Division

369.02 Services - Underground

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2017

Based Upon Broad Group/Remaining Life Procedure and Technique

***Average Service Life:* 53** ***Survivor Curve:* R4**

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
2007	73,138,976.50	53.00	1,379,965.55	42.54	58,698,203.80
2008	82,027,025.08	53.00	1,547,662.74	43.53	67,367,341.29
2009	68,753,145.91	53.00	1,297,214.94	44.52	57,754,900.08
2010	73,204,230.31	53.00	1,381,196.74	45.52	62,868,141.50
2011	45,812,989.31	53.00	864,386.54	46.51	40,205,242.12
2012	48,750,074.66	53.00	919,802.64	47.51	43,699,563.76
2013	53,355,648.38	53.00	1,006,699.30	48.51	48,832,029.58
2014	56,152,891.45	53.00	1,059,476.90	49.50	52,449,303.22
2015	57,426,503.19	53.00	1,083,507.04	50.50	54,720,649.12
2016	64,011,820.16	53.00	1,207,756.94	51.50	62,201,880.01
2017	91,156,858.15	53.00	1,719,921.85	52.50	90,297,599.01
Total	2,372,355,838.44	53.00	44,760,939.87	34.57	1,547,312,268.95

Composite Average Remaining Life ...* 34.57 *Years

PGE
Gas Division
378.00 Measuring and Regulating Station Equipment
Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 59 *Survivor Curve:* R2

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1934	1,025.41	59.00	17.38	7.28	126.54
1935	826.37	59.00	14.01	7.58	106.10
1936	1,854.46	59.00	31.43	7.87	247.48
1937	4,927.16	59.00	83.51	8.18	682.84
1938	6,132.20	59.00	103.94	8.49	882.05
1939	3,783.09	59.00	64.12	8.80	564.01
1940	8,350.98	59.00	141.54	9.11	1,289.68
1941	9,224.13	59.00	156.34	9.44	1,475.15
1942	9,804.79	59.00	166.18	9.76	1,622.12
1943	17,481.30	59.00	296.29	10.09	2,990.76
1944	24,976.61	59.00	423.33	10.44	4,417.86
1945	22,033.80	59.00	373.45	10.78	4,026.58
1946	22,333.49	59.00	378.53	11.14	4,215.49
1947	20,109.45	59.00	340.84	11.50	3,919.32
1948	35,063.71	59.00	594.30	11.87	7,054.68
1949	47,963.21	59.00	812.93	12.25	9,958.33
1950	85,817.17	59.00	1,454.52	12.64	18,382.62
1951	86,320.96	59.00	1,463.06	13.04	19,072.10
1952	149,820.29	59.00	2,539.32	13.44	34,134.66
1953	145,856.15	59.00	2,472.13	13.86	34,260.60
1954	156,230.90	59.00	2,647.97	14.28	37,823.94
1955	125,162.77	59.00	2,121.40	14.72	31,226.93
1956	142,128.24	59.00	2,408.95	15.17	36,533.40
1957	330,237.69	59.00	5,597.23	15.62	87,429.74
1958	179,847.75	59.00	3,048.26	16.09	49,035.04
1959	226,344.03	59.00	3,836.33	16.56	63,538.26
1960	156,603.12	59.00	2,654.28	17.05	45,250.55

PGE

Gas Division

378.00 Measuring and Regulating Station Equipment

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2017

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 59 *Survivor Curve:* R2

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1961	199,698.83	59.00	3,384.72	17.54	59,378.09
1962	450,030.26	59.00	7,627.61	18.05	137,675.02
1963	315,787.40	59.00	5,352.31	18.57	99,370.49
1964	432,511.11	59.00	7,330.67	19.09	139,947.53
1965	416,539.55	59.00	7,059.97	19.63	138,570.18
1966	1,074,632.85	59.00	18,214.06	20.17	367,451.68
1967	495,194.84	59.00	8,393.11	20.73	173,975.00
1968	715,079.76	59.00	12,119.96	21.30	258,094.75
1969	291,493.28	59.00	4,940.55	21.87	108,054.72
1970	477,767.56	59.00	8,097.73	22.45	181,826.46
1971	844,948.71	59.00	14,321.12	23.05	330,096.77
1972	1,270,562.00	59.00	21,534.88	23.65	509,390.73
1973	1,396,863.91	59.00	23,675.58	24.27	574,549.76
1974	713,392.60	59.00	12,091.36	24.89	300,936.08
1975	803,410.05	59.00	13,617.08	25.52	347,516.09
1976	765,835.80	59.00	12,980.23	26.16	339,577.43
1977	682,374.46	59.00	11,565.63	26.81	310,056.66
1978	380,058.06	59.00	6,441.64	27.47	176,931.93
1979	399,391.11	59.00	6,769.32	28.13	190,443.86
1980	757,570.66	59.00	12,840.14	28.81	369,872.51
1981	920,024.76	59.00	15,593.59	29.49	459,848.12
1982	864,503.73	59.00	14,652.56	30.18	442,226.05
1983	1,030,638.06	59.00	17,468.39	30.88	539,416.77
1984	799,720.49	59.00	13,554.54	31.58	428,119.85
1985	1,706,343.64	59.00	28,920.99	32.30	934,142.17
1986	1,868,193.20	59.00	31,664.19	33.02	1,045,608.82
1987	2,414,617.32	59.00	40,925.59	33.75	1,381,227.76

PGE
Gas Division
378.00 Measuring and Regulating Station Equipment
Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 59 *Survivor Curve:* R2

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1988	2,374,910.78	59.00	40,252.60	34.49	1,388,192.15
1989	3,427,726.72	59.00	58,096.88	35.23	2,046,818.20
1990	3,772,941.94	59.00	63,947.97	35.98	2,300,883.05
1991	5,215,440.53	59.00	88,397.02	36.74	3,247,635.51
1992	5,292,109.74	59.00	89,696.49	37.50	3,364,006.88
1993	2,803,086.13	59.00	47,509.78	38.27	1,818,401.57
1994	5,576,806.35	59.00	94,521.84	39.05	3,691,384.16
1995	4,702,605.63	59.00	79,704.93	39.84	3,175,316.30
1996	3,828,903.14	59.00	64,896.46	40.63	2,636,720.84
1997	4,964,190.31	59.00	84,138.55	41.43	3,485,536.00
1998	5,794,273.08	59.00	98,207.71	42.23	4,147,346.80
1999	4,289,856.19	59.00	72,709.20	43.04	3,129,431.45
2000	5,184,236.81	59.00	87,868.14	43.86	3,853,468.31
2001	5,180,047.39	59.00	87,797.14	44.68	3,922,553.09
2002	5,034,406.37	59.00	85,328.65	45.51	3,882,906.85
2003	4,092,589.20	59.00	69,365.70	46.34	3,214,227.87
2004	3,063,297.41	59.00	51,920.13	47.18	2,449,434.09
2005	3,681,333.83	59.00	62,395.29	48.02	2,996,329.72
2006	4,559,563.03	59.00	77,280.49	48.87	3,776,823.66
2007	3,397,036.57	59.00	57,576.71	49.73	2,863,066.13
2008	4,936,306.23	59.00	83,665.94	50.59	4,232,397.48
2009	9,323,365.71	59.00	158,022.65	51.45	8,130,656.71
2010	14,373,866.91	59.00	243,624.09	52.32	12,746,947.78
2011	15,852,460.16	59.00	268,684.92	53.20	14,293,504.81
2012	28,588,180.13	59.00	484,543.90	54.08	26,203,354.78
2013	29,704,706.18	59.00	503,468.01	54.96	27,671,829.73
2014	26,584,288.94	59.00	450,579.75	55.85	25,165,951.16

PGE
Gas Division
378.00 Measuring and Regulating Station Equipment

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 59 *Survivor Curve:* R2

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
2015	32,563,822.47	59.00	551,927.45	56.75	31,319,996.64
2016	46,291,568.73	59.00	784,600.38	57.64	45,227,544.91
2017	52,659,272.46	59.00	892,527.22	58.55	52,254,926.80
Total	371,620,642.30	59.00	6,298,635.06	50.72	319,482,165.52

Composite Average Remaining Life ... 50.72 Years

PGE
Gas Division
380.00 Services

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: **60** *Survivor Curve:* **R3**

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1943	17,238.84	60.00	287.31	6.80	1,954.86
1944	34,252.72	60.00	570.88	7.10	4,050.95
1945	68,171.19	60.00	1,136.19	7.39	8,392.95
1946	150,096.96	60.00	2,501.62	7.69	19,236.35
1947	366,871.47	60.00	6,114.53	8.00	48,940.22
1948	515,480.98	60.00	8,591.36	8.33	71,574.92
1949	669,674.97	60.00	11,161.26	8.67	96,743.77
1950	842,929.28	60.00	14,048.83	9.02	126,714.19
1951	1,080,874.79	60.00	18,014.59	9.38	169,017.67
1952	1,211,034.83	60.00	20,183.93	9.76	196,992.14
1953	1,476,949.30	60.00	24,615.84	10.15	249,905.96
1954	1,750,642.73	60.00	29,177.40	10.56	308,087.15
1955	2,283,665.85	60.00	38,061.12	10.98	417,984.86
1956	2,490,765.36	60.00	41,512.78	11.42	474,083.62
1957	2,867,003.12	60.00	47,783.42	11.87	567,334.60
1958	3,138,576.72	60.00	52,309.65	12.34	645,680.55
1959	4,318,329.79	60.00	71,972.21	12.83	923,351.62
1960	4,770,644.93	60.00	79,510.80	13.33	1,059,836.09
1961	4,859,719.88	60.00	80,995.39	13.85	1,121,602.45
1962	5,162,707.76	60.00	86,045.19	14.38	1,237,149.34
1963	6,615,677.20	60.00	110,261.36	14.93	1,646,003.48
1964	7,703,259.71	60.00	128,387.75	15.49	1,989,109.24
1965	7,783,999.64	60.00	129,733.41	16.07	2,085,066.96
1966	7,730,844.33	60.00	128,847.49	16.66	2,147,067.04
1967	8,620,969.00	60.00	143,682.91	17.27	2,481,731.62
1968	10,413,199.19	60.00	173,553.44	17.89	3,104,989.68
1969	13,643,252.00	60.00	227,387.69	18.53	4,212,940.79

PGE
Gas Division
380.00 Services

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 60 **Survivor Curve:** R3

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1970	12,445,036.74	60.00	207,417.42	19.18	3,977,574.68
1971	13,321,708.03	60.00	222,028.62	19.84	4,404,528.29
1972	15,628,487.53	60.00	260,474.97	20.51	5,342,135.28
1973	17,641,524.43	60.00	294,025.61	21.20	6,231,918.01
1974	19,708,989.61	60.00	328,483.38	21.89	7,190,141.98
1975	19,902,638.22	60.00	331,710.86	22.60	7,496,100.59
1976	20,860,268.44	60.00	347,671.38	23.32	8,106,907.35
1977	25,036,350.92	60.00	417,272.80	24.05	10,034,155.24
1978	23,020,007.92	60.00	383,667.06	24.78	9,509,185.48
1979	28,736,021.14	60.00	478,934.01	25.54	12,229,625.79
1980	28,287,450.27	60.00	471,457.82	26.29	12,395,441.20
1981	24,207,802.63	60.00	403,463.65	27.06	10,918,396.03
1982	23,633,220.31	60.00	393,887.27	27.84	10,965,902.17
1983	26,015,376.53	60.00	433,589.90	28.63	12,412,484.49
1984	33,983,588.96	60.00	566,393.53	29.42	16,664,386.67
1985	57,446,909.08	60.00	957,449.13	30.23	28,940,976.46
1986	68,120,836.63	60.00	1,135,348.04	31.04	35,239,236.37
1987	62,202,389.99	60.00	1,036,707.20	31.86	33,030,580.88
1988	87,437,172.16	60.00	1,457,287.19	32.69	47,640,968.16
1989	86,647,647.06	60.00	1,444,128.43	33.53	48,421,133.62
1990	90,549,113.17	60.00	1,509,152.91	34.37	51,876,618.30
1991	103,796,067.25	60.00	1,729,935.62	35.23	60,943,953.42
1992	104,556,394.89	60.00	1,742,607.76	36.09	62,888,521.71
1993	85,139,433.17	60.00	1,418,991.51	36.96	52,444,072.48
1994	88,946,984.35	60.00	1,482,450.74	37.84	56,089,223.44
1995	57,145,999.23	60.00	952,433.96	38.72	36,877,245.04
1996	69,020,865.79	60.00	1,150,348.54	39.61	45,563,560.36

PGE

Gas Division

380.00 Services

Original Cost Of Utility Plant In Service

And Development Of Composite Remaining Life as of December 31, 2017

Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 60 **Survivor Curve:** R3

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1997	83,572,259.17	60.00	1,392,871.93	40.51	56,419,686.30
1998	62,793,286.87	60.00	1,046,555.49	41.41	43,335,997.07
1999	70,817,454.02	60.00	1,180,291.70	42.32	49,948,688.27
2000	55,494,895.57	60.00	924,915.55	43.24	39,989,050.98
2001	62,405,873.34	60.00	1,040,098.59	44.16	45,926,598.70
2002	66,467,112.93	60.00	1,107,785.96	45.08	49,943,654.87
2003	66,251,212.14	60.00	1,104,187.61	46.02	50,811,898.83
2004	66,927,622.90	60.00	1,115,461.14	46.95	52,375,863.46
2005	70,162,771.04	60.00	1,169,380.31	47.90	56,010,967.31
2006	76,829,120.40	60.00	1,280,486.20	48.85	62,546,473.92
2007	79,507,358.61	60.00	1,325,123.54	49.80	65,988,408.57
2008	114,472,153.58	60.00	1,907,870.52	50.75	96,831,416.86
2009	96,610,779.68	60.00	1,610,180.75	51.71	83,268,872.22
2010	104,869,726.75	60.00	1,747,829.96	52.68	92,070,532.59
2011	127,546,812.44	60.00	2,125,781.64	53.64	114,036,835.17
2012	190,876,977.34	60.00	3,181,285.10	54.62	173,746,742.48
2013	411,559,930.06	60.00	6,859,336.80	55.59	381,301,565.51
2014	239,071,082.91	60.00	3,984,520.74	56.56	225,382,740.78
2015	211,895,246.46	60.00	3,531,589.83	57.54	203,219,827.79
2016	319,595,860.90	60.00	5,326,601.28	58.52	311,734,381.51
2017	329,545,545.75	60.00	5,492,429.47	59.51	326,840,925.38
Total	4,301,298,199.85	60.00	71,688,351.76	46.10	3,304,981,645.14

Composite Average Remaining Life ... 46.10 Years

PGE
Gas Division
381.00 Meters

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 30 *Survivor Curve:* S1

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1958	18,289.73	30.00	609.66	0.50	304.83
1959	50,353.56	30.00	1,678.45	0.55	930.81
1960	60,187.86	30.00	2,006.26	0.76	1,521.27
1961	65,361.15	30.00	2,178.70	0.99	2,152.60
1962	75,496.79	30.00	2,516.56	1.25	3,148.97
1963	108,241.00	30.00	3,608.03	1.52	5,483.32
1964	166,444.22	30.00	5,548.14	1.79	9,903.51
1965	176,229.92	30.00	5,874.33	2.06	12,123.47
1966	246,115.84	30.00	8,203.86	2.35	19,251.59
1967	171,370.34	30.00	5,712.34	2.63	15,011.42
1968	241,265.17	30.00	8,042.17	2.92	23,470.88
1969	407,118.37	30.00	13,570.61	3.21	43,606.92
1970	649,663.75	30.00	21,655.46	3.51	75,977.90
1971	615,497.34	30.00	20,516.58	3.81	78,198.19
1972	831,561.39	30.00	27,718.71	4.12	114,178.03
1973	862,258.12	30.00	28,741.94	4.43	127,291.46
1974	793,660.03	30.00	26,455.33	4.75	125,548.14
1975	809,043.82	30.00	26,968.13	5.07	136,670.54
1976	1,228,166.51	30.00	40,938.88	5.39	220,800.56
1977	1,360,587.16	30.00	45,352.90	5.73	259,701.83
1978	1,719,335.54	30.00	57,311.18	6.07	347,597.12
1979	1,683,750.36	30.00	56,125.01	6.41	359,690.05
1980	2,275,624.67	30.00	75,854.15	6.76	512,771.89
1981	2,458,424.68	30.00	81,947.49	7.12	583,310.43
1982	1,545,007.12	30.00	51,500.24	7.48	385,352.25
1983	1,030,330.51	30.00	34,344.35	7.86	269,781.33
1984	4,278,752.30	30.00	142,625.07	8.24	1,174,631.57

PGE
Gas Division
381.00 Meters

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 30 *Survivor Curve:* S1

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
1985	6,155,587.63	30.00	205,186.25	8.62	1,769,596.05
1986	8,489,742.40	30.00	282,991.41	9.02	2,553,153.06
1987	5,683,958.50	30.00	189,465.28	9.43	1,786,458.50
1988	6,250,070.31	30.00	208,335.67	9.85	2,051,196.37
1989	6,333,837.40	30.00	211,127.91	10.27	2,168,847.97
1990	8,673,746.34	30.00	289,124.87	10.71	3,096,683.79
1991	8,546,925.36	30.00	284,897.51	11.16	3,179,521.19
1992	7,710,485.28	30.00	257,016.17	11.62	2,986,998.33
1993	7,248,147.73	30.00	241,604.92	12.10	2,922,490.78
1994	7,484,917.39	30.00	249,497.24	12.58	3,139,841.95
1995	8,217,690.85	30.00	273,923.03	13.09	3,584,840.77
1996	14,482,021.14	30.00	482,734.03	13.60	6,567,296.84
1997	16,875,692.77	30.00	562,523.09	14.14	7,953,305.35
1998	19,823,340.35	30.00	660,778.00	14.69	9,706,196.55
1999	21,924,762.33	30.00	730,825.40	15.26	11,150,251.65
2000	17,986,554.92	30.00	599,551.82	15.85	9,499,936.36
2001	18,811,396.49	30.00	627,046.54	16.45	10,316,114.53
2002	19,835,582.86	30.00	661,186.09	17.08	11,292,613.46
2003	20,997,019.36	30.00	699,900.64	17.73	12,409,253.71
2004	26,745,170.76	30.00	891,505.68	18.40	16,405,935.61
2005	31,086,786.09	30.00	1,036,226.19	19.10	19,790,517.90
2006	36,782,893.67	30.00	1,226,096.44	19.82	24,302,856.16
2007	44,943,313.68	30.00	1,498,110.44	20.57	30,814,052.81
2008	53,493,899.58	30.00	1,783,129.96	21.34	38,056,094.80
2009	65,729,406.18	30.00	2,190,980.18	22.15	48,519,304.95
2010	75,589,388.58	30.00	2,519,646.26	22.97	57,886,923.35
2011	53,676,427.60	30.00	1,789,214.23	23.83	42,638,959.98

PGE
Gas Division
381.00 Meters

Original Cost Of Utility Plant In Service
And Development Of Composite Remaining Life as of December 31, 2017
Based Upon Broad Group/Remaining Life Procedure and Technique

Average Service Life: 30 *Survivor Curve:* S1

Year (1)	Original Cost (2)	Avg. Service Life (3)	Avg. Annual Accrual (4)	Avg. Remaining Life (5)	Future Annual Accruals (6)
2012	68,707,659.74	30.00	2,290,255.30	24.72	56,608,870.73
2013	71,625,851.00	30.00	2,387,528.34	25.63	61,190,132.43
2014	65,528,304.77	30.00	2,184,276.80	26.57	58,027,616.76
2015	80,716,603.25	30.00	2,690,553.41	27.53	74,063,398.89
2016	71,756,001.85	30.00	2,391,866.70	28.51	68,184,194.16
2017	64,007,973.87	30.00	2,133,599.10	29.50	62,941,497.17
Total	1,065,849,297.28	30.00	35,528,309.49	21.74	772,473,363.77

Composite Average Remaining Life ... 21.74 Years