BEFORE THE CORPORATION COMMISSION

OF THE STATE OF KANSAS

IN THE MATTER OF THE APPLICATION OF KANSAS GAS SERVICE, A DIVISION OF ONE GAS, INC. FOR ADJUSTMENT OF ITS NATURAL GAS RATES IN THE STATE OF KANSAS	**)**	**DOCKET NO. 18-KGSG-560-RTS**

DIRECT TESTIMONY AND EXHIBITS OF

JAMES S. GARREN

RE: DEPRECIATION RATES

ON BEHALF OF

THE CITIZENS' UTILITY RATEPAYER BOARD

OCTOBER 29, 2018

DIRECT TESTIMONY AND EXHIBITS

OF JAMES S. GARREN

A. INTRODUCTION

Q. PLEASE STATE YOUR NAME, POSITION AND BUSINESS ADDRESS.

A. My name is James S. Garren. I am an analyst with the economic consulting firm of Snavely King Majoros & Associates, Inc. ("Snavely King").

Q. HAVE YOU PREPARED A SUMMARY OF YOUR QUALIFICATIONS AND EXPERIENCE?

A. Yes. Attachment A is a summary of my qualifications and experience.

Q. PLEASE DESCRIBE YOUR BACKGROUND IN UTILITY DEPRECIATION.

A. Since my employment at Snavely King in 2010, I have participated as an analyst in approximately 35 separate depreciation studies of electric, gas and water utilities on behalf of the firm's clients, most of which are state utility commissions or state-funded consumer advocate agencies. In that role, I have worked closely with the firm's principals in performing life and net salvage analyses, calculation of depreciation rates, and preparation of testimony. Additionally, I am familiar with the firm's proprietary depreciation software, the Snavely Comprehensive Investment Analysis System ("**SCIAS**"). I am also recognized as a Certified Depreciation Professional by the Society of Depreciation Professionals.[1]

[1] [1] "The Society of Depreciation Professionals was organized in 1987 to recognize the professional field of depreciation analysis and individuals contributing to this field; to promote the professional

Q. FOR WHOM ARE YOU APPEARING IN THIS PROCEEDING?

A. I am appearing on behalf of the Kansas Citizens' Utility Ratepayer Board ("CURB")

Q. WHAT IS THE OBJECTIVE OF YOUR TESTIMONY?

A. As part of its recent base rate case Application filed with the Kansas Corporation Commission ("KCC" or "Commission"), Kansas Gas Service ("KGS" or "the Company") has proposed to change various depreciation rates for its gas utility plant accounts. In its Application, the Company included two Depreciation Studies with accompanying Direct Testimony. The objective of my testimony is to detail my analysis of the Company's Depreciation Studies regarding average service lives and net salvage.

B. SUMMARY

Q. WHAT INFORMATION HAVE YOU REVIEWED IN PREPARATION FOR THIS TESTIMONY?

A. I have reviewed the written direct testimony and exhibits of Dr. Ronald White of Foster Associates, who presents testimony on the Company's two Depreciation Studies – a Depreciation Study based on gas plant balances at December 31, 2016 ("EoY 2016"), and a Technical Update to present depreciation rates based on gas plant balances at December

development and professional ethics of practitioners in the field of depreciation analysis; to collect and exchange information about depreciation analysis; and to provide a national forum of programs and publications concerning depreciation." http://www.depr.org/?page=AboutUs . For certification, an applicant must have at least 5 years of full time professional depreciation experience, at least 2 years of which must be in the area of depreciation administration. Among other requirements, the applicant must pass a two part (Technical and Ethics) closed book examination which includes questions about, *inter alia*, Plant and Reserve Accounting, Life Analysis Concepts, Life Analysis Using Actuarial Models, Life Analysis Using Simulation Models, Salvage and Cost of Retiring Analysis, Technology Forecasting and Depreciation Calculations." http://www.depr.org/?page=Certification

31, 2017 ("EoY 2017"). Based upon this review, I prepared numerous data requests which were propounded upon KGS. In addition, on September 13th, I had the opportunity to accompany KGS employees, as well as Roxie McCullar of Dunkel and Associates, on a visit to observe several replacement projects involving KGS's mains and services.

Based on my review of the Company's testimony, my participation in the field visit, and my analysis of the Company's responses to data requests, including my analysis of Dr. White's study and workpaeprs that were provided in discovery, I have developed CURB's recommended proposed depreciation rates and plant accruals.

Q. HOW DO YOUR PROPOSED DEPRECIATION RATES AND EXPENSE ACCRUALS COMPARE WITH THOSE RECOMMENDED BY DR. WHITE?

A. In general, I am recommending lower depreciation rates and lower depreciation expense accruals than those recommended by Dr. White.

Q. PLEASE SUMARIZE WHY YOUR PROPOSED DEPRECIATION RATES ARE GENERALLY LOWER THAN THOSE PROPOSED BY DR. WHITE.

A. I am proposing four adjustments to Dr. White's proposals. However, the primary drivers of my adjustments relate to service lives and net salvage. First, I am proposing alternative average service lives and retirement dispersion curves for nine accounts. Second, I am proposing to utilize a different methodology than Dr. White for estimating future net salvage. I will discuss this adjustment in detail below, but in summary, I am proposing to estimate the required current annual net salvage accruals and the total future net salvage

using uninflated current activity rather than inflated future activity.[2] This approach does not front load future inflation into current accruals charged to current ratepayers. Third, I am proposing that the Commission reject use of the Vintage Group procedure to calculate remaining lives in favor of the Broad Group procedure. Finally, I am proposing that the Commission reject Dr. White's proposal to redistribute depreciation reserves to recalculate depreciation rates.

Q. WOULD YOU PLEASE SUMMARIZE THE TOTAL IMPACT OF THE ADJUSTMENTS YOU HAVE MADE?

A. Yes. Please refer to the table below for comparison of the depreciation rates and expenses:

Table JSG-1

Summary of Depreciation Rates and Expenses
Based on December 31, 2017 Plant Balances

	KGS Rate	KGS Expense	CURB Rate	CURB Expense	Adjustment
Transmission	2.48%	$6,843,728	1.98%	$5,461,651	($1,382,167)
Distribution	3.33%	$48,127,901	2.92%	$42,230,080	($5,897,831)
General	4.49%	$4,854,373	4.83%	$5,219,076	$364,703
Total	3.27%	$59,826,002	2.89%	$52,910,807	$6,915,295

[2] The one exception with regard to net salvage is that I am proposing to utilize the same net salvage ratio for Account 380.10 Services – Metallic as for 380.20 Services – Plastic.

This comparison is based on plant balances at December 31, 2017. My adjustment of $6.9 million differs from the adjustment shown in Ms. Crane's testimony because her adjustment is based on pro forma utility plant-in-service claimed by KGS, rather than solely on December 31, 2017 plant balances. In addition, Ms. Crane's adjustment includes the impact of capitalizing depreciation for transportation equipment and power operated equipment, as shown on lines 15-16 of the Company's filing, Section 10, Schedule 10-F, page 3. For these reasons, Ms. Crane's adjustments reflect a composite depreciation rate of 2.76% instead of the 2.89% shown above.

Q. ARE YOU SPONSORING ANY EXHIBITS IN CONJUNCTION WITH THIS TESTIMONY?

A. Yes. I have prepared Exhibit JSG-1, Schedule 1 which shows the calculation of my proposed depreciation rates related to service lives and net salvage. Exhibit JSG-1, Schedule 2 shows the calculation of total future net salvage. Exhibit JSG-2 contains the service life analysis for the accounts that I am proposing to adjust.

Q. CAN YOU SUMMARIZE THE ISSUES THAT YOU ARE GOING TO BE ADDRESSING IN THIS TESTIMONY?

A. Yes. In this testimony, I will be addressing four issues. First is the selection of average service lives for both gas plant. Second, I will discuss the estimation of future net salvage. Third, I will discuss why I am proposing the use of the Broad Group ("BG") procedure rather than the Vintage Group ("VG") procedure to calculate remaining lives. Finally, I

will discuss redistribution of depreciation reserves. What follows are some high-level bullet points regarding these issues.

Life analysis

- I am proposing to adjust the average service lives of nine accounts.
- My proposed adjustments to average service lives are relatively minor, both in terms of the magnitude of the adjustment to average service lives, and also in terms of the impact on the annual depreciation expense accrual.
- Nonetheless, these proposed adjustments are necessary to bring future depreciation expectations in line with the historical indications as accurately as possible.

BG versus VG

- Under the Broad Group procedure all units of plant within a particular depreciation category, usually a plant account or subaccount, are considered to be one group.[3] Under the Vintage Group procedure, each vintage within the depreciation category is considered to be a separate group.[4] Both procedures are acceptable, but I find the additional VG subdivision to be an unnecessary refinement.

Net Salvage analysis

[3] Public Utility Depreciation Practices, NARUC, August 1996, page 316.
[4] Id., page 326.

- I am proposing to adopt a net salvage method that utilizes the most recent five-year average of recorded net salvage to estimate required annual accruals and future net salvage over the remaining life of plant.
- This method is superior to the alternative method proposed by Dr. White because it matches future estimates to the Company's actual experience.
- Dr. White's proposed method is flawed due to reliance on a ratio of two numbers, net salvage and retirements, that are not related, thereby resulting in unreliable future indications.
- The ratio Dr. White is proposing also utilizes data from two different time periods, resulting in the inclusion of significant inflation that should not be charged to ratepayers.

Redistribution of Reserves

- Under my recommended remaining life technique, depreciation reserves fulfil the role of providing feedback on the appropriateness of depreciation rates over time. At the same time, they correct over or under depreciation expense accruals through the calculation of remaining life rates. Redistribution of reserves, utilized by Dr. White, defeats the purpose of the remaining life technique by masking reserve imbalances while allowing over and under depreciation expense accruals to continue.

C. DISCUSSION OF SERVICE LIVES

Q. WOULD YOU PLEASE EXPLAIN YOUR ADJUSTMENT TO SERVICE LIVES?

A. I have identified nine accounts where I believe Dr. White proposed average service lives that vary from the historical indications. Because each of these adjustments are relatively small on their own, I will eschew discussion of the individual accounts and simply discuss my service life analysis generally.

I have reviewed Dr. White's testimony, workpapers and responses to data requests to understand Mr. White's rationale for instances where he deviates from the historical indications, but, in many cases, Dr. White has not provided detailed explanations for his recommendations. Nevertheless, from his workpapers I can infer that for several accounts for which I am proposing alternative service life and curve combinations, Dr. White has demonstrated a deference for the currently approved life and curve. While this deference is laudable when there is limited data for analysis, such as when there is a stub curve, these accounts do have significant retirement data, and in many cases the available data shows a full life cycle.

Q. PLEASE DEFINE "AVERAGE SERVICE LIFE" AS IT IS USED IN UTILITY DEPRECIATION CALCULATIONS.

A. The "average service life" for a given account is a projection of the number of years that a new unit of plant can be expected to remain used and useful, on average. This concept is useful because modern depreciation utilizes what we call "group depreciation." That is, rather than depreciate the value of an individual unit or units over the lifetime of those units, the utility depreciates the value of a collection of units collectively. This group depreciation assumes that many units in each account will be retired at earlier ages, and thus have a shorter than average life, and many units will retire at later ages, and thus have a longer than average life. Average service life is used to calculate the average remaining

life, which, in turn, is the denominator in the calculation of depreciation expense. Group depreciation is also why we do not study the lives of units in an account, but rather, the lives of dollars in these accounts. Therefore, all else being equal, a longer average service life directly results in a lower depreciation expense.

Q. PLEASE DESCRIBE THE PROPER WAY TO DETERMINE THE AVERAGE SERVICE LIFE COMPONENT OF DEPRECIATION RATES.

A. I have analyzed KGS's distribution accounts using an actuarial life analysis process called the Retirement Rate method. Actuarial methodologies were developed initially in the 17th and 18th centuries, primarily by life insurance companies that needed mathematical means of estimating the mortality risk of individuals over a long period of time. This resulted in the development of "life tables," which show the mortality risk of a group of individuals with similar risk factors at each age.

The Retirement Rate method is an actuarial technique used to study plant lives, much like the actuarial techniques used in the insurance industry to study human lives. It requires a record of the dates of placement (birth) and retirement (death) for each asset unit studied. Retirement data that contains this date of placement and retirement is referred to as "aged data" because it tells the analyst the age of the plant at the time it was retired. The Retirement Rate method is the most sophisticated of the statistical life analysis methods because it relies on the most refined level of data.

In the Retirement Rate method, aged retirement data as described above, and total plant in service at a given age (referred to collectively as "exposures") from a company's records are used to construct an observed or original life table. I discuss the composition of an observed life table in detail below, but the details are important because they result

in data points showing the percentage of a given unit of plant that is expected to survive at a given age. The actuarial analysis smooths and extends the observed life table by fitting it to a family of 31 standardized survivor curves ("Iowa curves"). The curve-fitting process uses the least squared differences approach to find a best fit life for each curve. The "sum of least squared difference" is a common means of fitting curves (in this case the Iowa curves) to a set of data (in this case the observed life table data). The difference between each point of data and a point on a line is squared, and the square of all those differences is summed to provide the total difference between the set of data and the line. The line that produces the least difference from the set of data is considered the "best fit." The purpose of squaring the difference is to ensure that negative differences contribute to the overall difference rather than canceling out positive differences.

Numerous iterative calculations are required for a Retirement Rate analysis. In the end, the analysis produces a life and Iowa curve best fit for a single average vintage. My understanding is that this is the same type of life analysis that KGS performed for its depreciation studies.

Q. WHAT ARE IOWA CURVES?

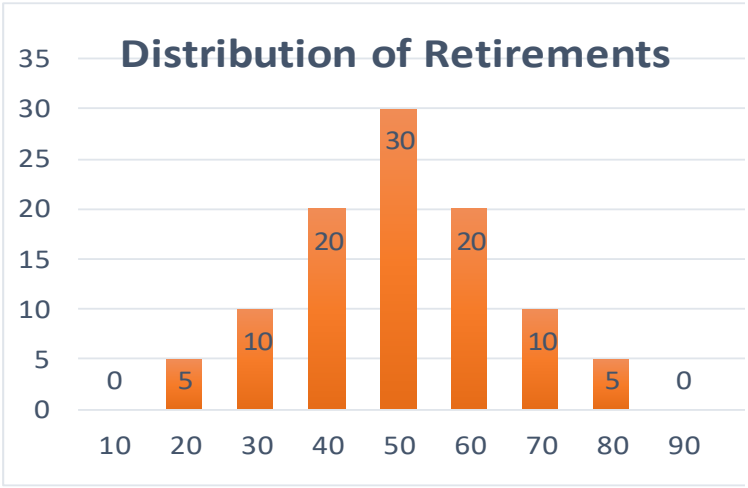
A. An Iowa curve is a surrogate or standardized observed life table based on a specific pattern of retirements around an average service life. The Iowa curves were devised over 60 years ago at Iowa State University. The curves provide a set of standard patterns of retirement dispersion. Retirement dispersion merely recognizes that accounts are comprised of individual assets or units having different lives.

For example, imagine an account that begins with a new addition of one hundred units. These units are unlikely to all retire at the same time. Rather, different units within

the group will retire at different times. Represented graphically, the result might appear as follows:

Graph JSG-1

Age:	Units Retired
10	0
20	5
30	10
40	20
50	30
60	20
70	10
80	5
90	0

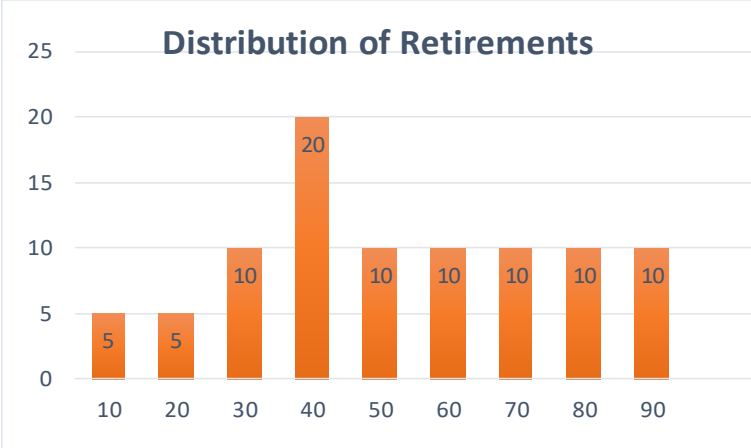


In this example, the average service life would be fifty, and the retirement dispersion curve would tell us how the retirements are arranged around the average service life. In this example, the distribution of retirements around the average service life is symmetrical, with the "mode," or the age with the highest number of retirements, being at the average service life. In this data, the retirements are also relatively tightly grouped around the average service life.

Iowa curves describe many different patterns of dispersions. Returning to our example, imagine a different pattern of retirements as follows:

Graph JSG-2

Age:	Units Retired
10	5
20	5
30	10
40	20
50	10
60	10
70	10
80	10
90	10



In this example, the average service life is still fifty, but the dispersion characteristics are very different. The mode is at age 40, which is an earlier age than the average, and overall the distribution of retirements is more spread out than in the previous example. By using different types of Iowa curves, I can capture these different characteristics that can be seen in retirement data.

One way that Iowa curves illustrate these different patterns is by their orientation as left-skewed, symmetrical or right-skewed curves, which are known, respectively, as "L curves," "S curves," and "R curves." The letters describe the location of the "mode," as discussed above, relative to the average service life. Hence, in the first example, which is symmetrical, I would use an "S curve," whereas in the second example, in which the mode was at a younger age than the average service life, I would use an "L curve." If the mode falls after the average service life, then I would use an "R curve." In addition to L, S and R curves, there is a set of Origin Modal, or "O curves," which are so called because the mode for these curves is at age one, or the "origin." Generally speaking, O-shaped Iowa curves are not appropriate for utility plant.

In addition to the letter that describes the location of the mode, Iowa curves are numbered one through six, which identifies the spread of the retirement dispersion. Lower numbers represent a wider retirement dispersion. Referring to the first example above, in which the retirements were more tightly grouped around the average service life, a higher number would be used, whereas in the second example, in which the retirements were more diffuse, a lower number would be used.

To combine these two concepts, an appropriate Iowa curve for the first example might be an S5, whereas an appropriate Iowa curve for the second example might be a L2. This combination of one letter and one number defines a dispersion pattern. Adding an average service life to an Iowa curve (*e.g.*, 5-S0) provides a survivor curve intended to depict a reasonable expectation of how a group of assets will survive, or conversely be retired, over the expected average service life.

Table JSG-2 below compares curves with the same shape (S0) but different average service lives (5- and 10-years) to illustrate different iterations with the same curve. The percent surviving represents the amount of plant surviving at each age interval shown in the first column. The 5 S0 life and curve sums to the five-year average service life, while the 10 S0 life and curve sums to a ten-year average service life.

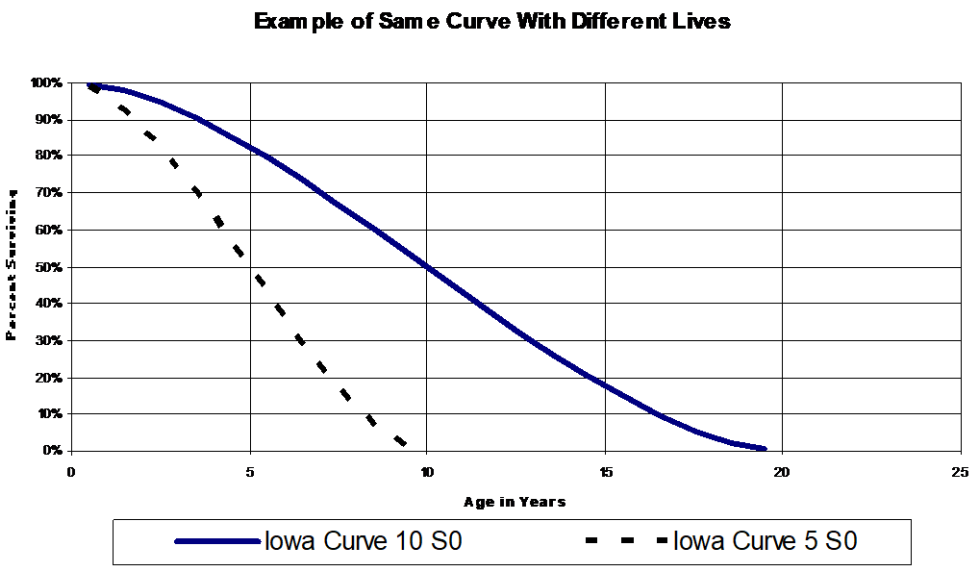
Table JSG-2

Sample Survivor Curves

Age	5 S0 Curve Percent Surviving	10 S0 Curve Percent Surviving
0.5	0.99	1.00
1.5	0.92	0.98
2.5	0.83	0.94
3.5	0.70	0.90
4.5	0.57	0.85
5.5	0.43	0.80
6.5	0.30	0.74
7.5	0.17	0.67
8.5	0.08	0.60
9.5	0.01	0.53
10.5		0.47
11.5		0.40
12.5		0.33
13.5		0.26
14.5		0.20
15.5		0.15
16.5		0.10
17.5		0.06
18.5		0.02
19.5		0.00
Total	**5.00**	**10.00**

These are called "curves" because, when plotted on charts with the x-axis representing "age" and the y-axis representing "percent surviving," they appear as shown below in Graph 3:

Graph JSG-3



Q. HOW DO YOU USE THE IOWA CURVES IN YOUR SERVICE LIFE ANALYSIS?

A. The purpose of Iowa curves is to enable the calculation of an average remaining life. Remaining life calculations take the current age of each vintage within an account and then use the retirement rate projected by the appropriate Iowa curve to project the remaining life of each of these vintages of plant. Ultimately, depreciation accruals for plant investment are calculated from remaining lives, so it is important to select the correct average service life and the correct Iowa curve.

Q. IS IT NECESSARY TO FIT ALL OF THE AVAILABLE DATA POINTS TAKEN FROM THE OBSERVED LIFE TABLE?

A. No. In some cases, it is appropriate to disregard some or even many of the oldest aged data. This is because actuarial data that the company keeps often is tied to long-lived assets that represent so small a percentage of the total plant as to not be statistically significant or represent accounting anomalies, such as retirements that were never recorded. This

process, which is represented in the graphs below, is called a "T-cut." While there is no hard and fast rule for where a T-cut is appropriate, it is generally appropriate to make a T-cut where the remaining retirement data diverges materially from the established pattern of retirements seen to that point.

The decision to make a T-cut, and at what point in the data set to make the cut, is one of the most important, yet subjective, elements to an actuarial analysis. In most cases, making a "larger" T-cut (that is, one that results in fitting the curve to less of the actuarial data) will result in a shorter estimated average service life, because the data eliminated is for the longest-lived assets in the set of data.

Additionally, an inconclusive analysis may occur if data points are eliminated from an observed life table with a limited data set (that is, an account that has a short history of plant exposed to retirement). Typically, the portion of an Iowa curve between 85% surviving and 15% surviving most distinguishes one curve from another. Apart from O curves, Iowa curves follow a parabolic distribution of retirements that is, as we discussed above, they tend to have limited retirements at the beginning and end of the service lives. Thus, the portion between 85% and 15% surviving is the most indicative because that is when the bulk of retirements in a given account happen, and where variation in the pattern of retirements tends to occur. If a T-cut eliminates too much of the observed life table data, the matching of that data to an Iowa curve will be more likely to produce ambiguous and misleading results. Therefore, I believe that the full set of aged data should be used in the service life analysis unless specific circumstances warrant exclusion of the data.

Q. DO YOU HAVE ANY CONCERNS WITH THE SERVICE LIVES COMPONENT OF DR. WHITE'S DEPRECIATION STUDIES FOR KGS?

A. Broadly, I believe that Dr. White's average service life analysis was appropriately conducted. Where I have a concern is in the lack of supporting discussion by Dr. White in explaining his conclusions and why, in some cases, he chose particular service lives. Dr. White's life analysis workpapers provide the reviewer with a plethora of information. We have curve fitting routines in first, second and third-degree polynomials, presented in Rolling, Shrinking and Progressing bands of time. The best-fit results from these three polynomial curve fitting routines are then graphed by hazard function (that is, the number of retirements that occur and are expected to occur at a given age) and survivorship function (that is, the percentage of plant in service that survives and would be expected to survive at a given age). Dr. White then graphs his proposed life-curve and the currently approved life curve against the percent surviving.

While Dr. White's analysis undoubtedly provides a dizzying array of information, Dr. White provides no interpretation that allows a reviewer to understand the basis of his recommendation. In nearly all cases, the results of curve-fitting for the three degrees provides wildly varying results, to say nothing of the massive collection of different bands Dr. White calculates. Dr. White gives no indication which statistical indicators he considers most reliable, either in any specific case, or in general. Thus, when his final proposal deviates from the historical indications that he does provide, there is frequently no clear link between that proposal and Dr. White's analysis.

Q. HAVE YOU PROVIDED THE RESULTS OF YOUR MATHEMATICAL FITTING ANALYSIS?

A. Yes, Exhibit JSG-2 includes a Schedule titled "Best Fit Curve Results" for each account studied that shows my mathematical curve fitting analysis. Except in limited cases, the "best fit" here, defined as the life-curve combination with the least sum of squared differences, has been selected as our proposed average service life and retirement dispersion curve for that account. These differ from the best fits resulting from Dr. White's analysis primarily because I am using different experience bands than those used by Dr. White. For each account, I have utilized "full band" analyses, which utilize the entire range of retirement experience.

Q. ARE THERE INSTANCES WHERE THE MATHEMATICAL BEST FIT LIFE AND CURVE ARE NOT APPROPRIATE?

A. Certainly. The mathematical best fit is appropriate in most cases in which the future retirement patterns can reasonably be expected to follow historical experience. However, this is not always the case. There are numerous factors that might lead a utility depreciation expert who is familiar with a specific plant account for a given company to conclude that future depreciation expectations are different than historical experience. These factors, including major replacement or maintenance projects, differing life expectations of new technologies, or economic or engineering decisions of utility management, might significantly affect the expectations for future retirement rates. Thus, informed judgment is an important component of the service life analysis, but any decision not to follow historical experience must be supported by a reasonable basis.

Q. ARE THERE ACCOUNTS THAT YOU STUDIED WHERE THE BEST FITTING CURVE IS NOT APPROPRIATE?

Yes. However, in the case of KGS, I have opted to utilize the best fitting average service life and curve shape on a sum of least squared differences basis where I have opted to propose alternative service life parameters.

D. VINTAGE GROUP V. BROAD GROUP PROCEDURE

Q. DO YOU AGREE WITH DR WHITE'S USE OF THE VINTAGE GROUP PROCEDURE FOR CALCULATING REMAINING LIVES?

A. No. Vintage Group procedure does not add any perceivable value to the calculation of the depreciation rates. There are several reasons not to use the Vintage Group procedure. First, because an average service life is calculated for each vintage of plant using this procedure, this methodology also introduces needless complexity to the depreciation rate calculation by introducing a vintage group average service life in addition to the estimated Projection Life. Second, the Vintage Group procedure is not very widely used, being less commonly used than the Broad Group procedure or the Equal Life Group procedures. Third, to arrive at an accurate average service life and remaining life, Vintage Group procedure is more dependent on consistent and accurate plant accounting. Given the number of acquisitions, sales, transfers and adjustments in KGS's plant records, the Vintage Group procedure isn't appropriate for KGS in my view.

Q. WHAT ARE YOU PROPOSING?

A. I am proposing the use of the Broad Group procedure for calculating remaining lives. Broad group procedure is much more commonly used throughout the industry.[5]

[5] Public Utility Depreciation Practices, published by the National Association of Regulatory Utility Commissioners, pg. 77.

E. DISCUSSION OF NET SALVAGE

Q. WHAT IS NET SALVAGE?

A. "Salvage" is the theoretical value of property after retirement. Net salvage is gross salvage minus cost of removal. Cost of removal is the cost that the Company incurs for the process of retiring plant in service. Gross salvage is the amount that the Company can recoup from its retirements through sales of parts and scrap. Thus, net salvage is the net of the proceeds received, less the cost of removal associated with plant retirements. Because net salvage is considered part of the cost of the investment in plant in service, it is collected as part of depreciation expense so that the utility can recoup its net salvage costs, just as a utility recoups the original investment in plant in service through depreciation expenses over the life of the asset.

Q. PLEASE DESCRIBE THE ISSUES ASSOCIATED WITH THE COLLECTION OF NET SALVAGE.

A. The primary issue is that companies are allowed to include the future cost of removing plant that is currently in-service as part of their current depreciation rates. This means that a utility collects cost of removal in current rates, via depreciation expense, for an expenditure that will be made at some point in the future. However, this presents an issue because the actual amount of net salvage that the Company will incur in the future is unknown. With net salvage, we are forced to estimate both the timing, and the expected amount of future net salvage that the Company will incur to retire its current plant in service.

Q. HOW IS DR. WHITE PROPOSING TO ESTIMATE THE COMPANY'S FUTURE NET SALVAGE?

A. Dr. White proposes a methodology that calculates a ratio of annual net salvage over retirements. This ratio is examined over twenty years of data, utilizing rolling three-year averages, a final five-year average, and an overall average. Dr. White then exercises his judgment to incorporate the historical data, the age of the plant, managerial expectations, and the experience of other utilities in the industry, and arrives at a net salvage ratio for each account.

Q. CAN YOU DESCRIBE YOUR CONCERNS WITH THIS METHODOLOGY?

A. Yes. I have several significant concerns with this methodology. First, this methodology produces unrealistically high future net salvage ratios. Second, net salvage and retirements are not causally related or mathematically correlated in any way, and therefore reliance on this ratio yields unreliable and unsound results. This type of analysis is insufficient to support the large amounts of future net salvage that KGS is proposing to collect in its proposed depreciation rates.

Q. CAN YOU EXPLAIN WHY YOU BELIEVE DR. WHITE'S METHODOLOGY RESULTS IN UNREALISTICALLY HIGH NET SALVAGE RATIOS?

A. Yes. In brief, there is a disconnect between the Company's actual incurred cost of removal and the future net salvage accruals that this methodology suggests. For example, if we look at Account 380.20 Services - Plastic, which is the Company's largest distribution account, the five-year average of net salvage from 2013-2017 was -$5.6 million. At the five-year average, we would expect there to be $175 million of future net salvage over the remaining life of this account. If we take the five-year average net salvage ratio of net salvage over retirements in this account, which is -177%, the total future net salvage over the remaining life would be $807 million. This means that the Company would be

collecting roughly *$632 million more* over the course of the life of the plant if the KCC utilized the actual five-year ratio of net salvage over retirements. Dr. White is not actually proposing to use the five-year average; he is only proposing a -60.8% net salvage ratio. However, even this more modest proposal results in the Company collecting *$102 million* more over the life of the plant then if my recommendation is adopted.

Q. DO FUTURE COST OF REMOVAL EXPENSES JUSTIFY HIGHER FUTURE NET SALVAGE RATIOS?

A. No. Setting aside the question of the accuracy of using net salvage as a ratio of retirements as a method for forecasting future net salvage, the logic of collecting large amounts for future net salvage is flawed. This is because KGS, like any utility, is continuously adding and retiring plant with no end date. This means that, in a real sense, the future never truly arrives. As plant in service increases, the amount being collected for future net salvage will increase in turn. The result is that *present* distribution customers will be constantly paying more for future net salvage costs than a reasonable estimate of those costs.

It is instructive to contrast this ongoing net salvage situation with net salvage for a single piece of plant with a final retirement date. In such cases, a terminal net salvage estimate is arrived at using a terminal net salvage study which carefully estimates the actual cost of removing all plant for the relevant unit. That terminal net salvage is then distributed over the remaining life of the plant. This is a reasonable application of the principle that current customers should bear the cost of future net salvage. However, with no termination date, current customers are perpetually asked to bear the cost of ill-defined and excessive future net salvage.

Q. CAN YOU EXPLAIN WHY NET SALVAGE AND RETIREMENTS ARE NOT

RELATED TO EACH OTHER?

A. Yes. There are two possible ways in which net salvage could be related to retirements: causally and mathematically correlated. First, let us examine how retirements and net salvage could be related causally, which would be if retirements were a causal driver of net salvage. There is an intuitive logic to this notion. A retirement happens when a given unit of plant is taken out of service. If, as part of taking that unit out of service, it needs to be physically removed, then there will be some cost to the Company associated with that removal. However, we know that this is not actually what drives most cost of removal expenditures. In fact, most retirements occur when old plant is being replaced by new plant.

Q. WHAT DID YOU LEARN ABOUT KGS'S REPLACEMENT AND REMOVAL PRACTICES DURING YOUR SITE VISIT?

A. During the site visit, I learned how the Company estimates the cost of removal that it records and the Company's actual practices regarding replacement projects. First, the cost of removal the Company records on replacement projects is the result of an allocation percentage of the total cost of the replacement project. This percentage is the result of an engineering estimate. What this means is that, in actual practice, the cost of removal that the Company records is driven entirely by new replacement projects. The result is that we would expect future Cost of Removal to more closely track with future plant additions, than with future retirements. This undermines the core logic of the cost of removal/retirement ratio methodology that Dr. White utilizes to estimate future net salvage.

Q. IS THERE ANOTHER WAY IN WHICH COST OF REMOVAL AND RETIREMENTS MIGHT BE RELATED?

A. Yes, retirements and net salvage could be mathematically correlated, that is, even without a causal relationship, it is possible that there is a close relationship between the two amounts, such that when one increases, it would be possible to reasonably predict that the other would also increase. The lack of any real correlative connection between net salvage and retirements is clear when we look at how much the net salvage to retirement ratio varies from year to year. To illustrate the variance in net salvage, I examined the ratios for the Company's largest transmission plant account, Account 380.20, Services – Plastic for the period of available data, from 2007-2017.

Table JSG-3

Net Salvage History Account 380.20 – Services - Plastic

YEAR	RETIREMENTS ($)	COST OF REMOVAL AMOUNT ($)	%	GROSS SALVAGE AMOUNT ($)	%	NET SALVAGE AMOUNT ($)	%
2007	722,579	1,822,725	252.3	0	0	(1,822,725)	(252.3)
2008	2,124,631	2,197,571	103.4	0	0	(2,197,571)	(103.4)
2009	5,962,874	4,941,742	82.9	6,979	0.1	(4,934,763)	(82.8)
2010	1,012,351	9,007,031	889.7	0	0	(9,007,031)	(889.7)
2011	1,223,914	7,545,600	616.5	0	0	(7,545,600)	(616.5)
2012	226,424	7,427,180	3,280	0	0	(7,427,180)	(3,280)
2013	105,248	6,240,227	5,929	0	0	(6,240,227)	(5,929)
2014	5,252,980	2,467,614	47.0	0	0	(2,467,614)	(47.0)
2015	6,199,486	4,100,056	66.1	0	0	(4,100,056)	(66.1)
2016	3,523,025	9,199,131	261.1	0	0	(9,19,131)	(261.1)

2017	907,285	6,326,485	697.3	0	0	(6,326,485)	(697.3)
TOTAL	27,260,797	61,275,362	224.8	6,979	25	(61,268,384)	(224.7)

Table JSG-3 reproduces the net salvage and retirement history for Account 380.20 – Services - Plastic. We can see the annual net salvage ratio for this account varies significantly, from a low of -47% in 2014, to a high of – 5,929% in 2013, just one year earliler. The table also illustrates that there is no trend from one year to the next. For example, in the three-year period 2011, 2012 and 2013, the net salvage ratios were -616.5%, -3,280%, and -5,929% respectively. Year-to-year, the net salvage ratio grew dramatically. This growth happened even though the actual cost of removal went down slightly year-to-year over this same period. This happens because while cost of removal was going down slightly, retirements dropped precipitously through this same period. In the very next year, 2014 retirements increase sharply from $105,248 in 2013 to $5,252,980 in 2014, while cost of removal dropped significantly in 2014, from $6,240,227 in 2013 to $2,467,614 in 2014. These types of unrelated swings in retirements and cost of removal happen because there is no mathematical relationship between retirements and cost of removal. Thus, retirements and net salvage amounts increase and decrease independent of each other. This lack of correlation means that net salvage ratios vary significantly for any given account from year to year, even relying on a five-year average. This result indicates that estimates of future cost of removal, sometimes forty years and more into the future, are extremely unreliable.

Q. ARE THERE ANY OTHER PROBLEMS WITH THE METHODOLOGY THAT DR. WHITE IS PROPOSING?

A. Yes. In addition to the other problems discussed above with regard to the ratio of net salvage to retirements, there is also a mismatch in the periods used for the data. Cost of removal is always expressed in current dollars, that is, an amount from 2012 is shown at 2012-dollar values. In contrast, retirements are always recorded at original cost. A given retirement may be recorded in 2012, but the dollar value of that retirement reflects investment that could have been made in 1986, 1970, or 1920, which will significantly impact the amount of the retirement and the resulting ratio.

What this means is that the method Dr. White is proposing contains a significant amount of inflation inherent in it. This range of historical inflation is implicitly projected out into the future and charged to current ratepayers. This introduces one relatively minor issue, the question of whether it is accurate to assume that future inflation will be the same as historical inflation. It also introduces a major issue, which is that current ratepayers are effectively being charged for future net salvage at their inflated future dollar values but are required to pay those amounts with current dollars.

Finally, there is the time-value of money to be considered. In effect, charging current ratepayers for future net salvage is asking current ratepayers to provide a loan to the Company for funds that will potentially be used for expenditures well into the future. Normally when the Company makes an investment in plant, ratepayers are expected to provide both a *return of* this investment, and also a *return on* this investment through the ratemaking process. However, with regard to future net salvage, current ratepayers are also being asked to provide the Company with a loan to pay for future costs without receiving any commensurate compensation.

Q. ARE THESE THE ISSUES STAFF WAS ATTEMPTING TO REMEDY WITH

THEIR PROPOSED NET SALVAGE METHODOLOGY IN DOCKET NO. 12-KGSG-835-RTS?

A. Yes. In the previous KGS rate case, Commission staff proposed that the KCC adopt a net salvage methodology based on SFAS-143. This methodology, known broadly as the "Present Value" methodology, takes the future net salvage estimated using the traditional methodology and applies a discount rate, typically the Company's approved rate of return, thereby discounting future net salvage back to the "present value" of those dollars.

Q. DO YOU AGREE WITH THE USE OF THE PRESENT VALUE METHODOLOGY IN THIS CASE?

A. The present value methodology does remedy some of the concerns presented by the traditional future net salvage estimation methodology. In fact, I have proposed the present value methodology in some cases where that methodology was well-established, such as in Maryland, where it is used state-wide. It is, in my view, a significant improvement over the traditional method.

However, it suffers from two principle problems. First, it is still fundamentally reliant on the traditional inflated methodology for estimating future net salvage amounts. Moreover, because of the discounting method, these future net salvage estimates tend to go under less scrutiny once the present value methodology is in place. Second, the present value methodology is highly dependent on the discount rate used. In my reading of SFAS-143, there is no clearly prescribed requirement for determining the appropriate discount rate. While the Company's rate of return is a reasonable rate based on the essential logic of the present value methodology, the discount rate used becomes a point of contention in utility rate cases.

Q. WHAT ARE YOU PROPOSING REGARDING THE COMPANY'S NET SALVAGE PROPOSALS?

A. I am proposing a methodology that utilizes the most recent five-year average of net salvage to estimate future net salvage. I have estimated total future net salvage by multiplying the annual accrual requirement by the account remaining life. This is a straight-line accrual estimate and approach. I believe that the Company's most recent five years of net salvage data provides the best indicator of the appropriate annual accrual for 2018 and the immediate future. This average should then be updated with each subsequent depreciation study, perhaps in a technical update like the one Dr. White has submitted in this proceeding. Accordingly, I propose that the Company calculate its total future net salvage by multiplying its required current annual net salvage accrual based on its most recent five-year average of net salvage for each account by the remaining life (*i.e.*, the plant not yet depreciated) for that account. This methodology is superior to the Company's proposal.

Q. PLEASE PROVIDE AN EXAMPLE.

A. I will use account 380.20 Services - Plastic to illustrate my recommendation. The most recent five-year average net salvage is negative $5.6 million, and I have estimated a 30.9-year remaining life for the account. The December 31, 2017 plant account balance was $456.3 million. Given these facts, I have calculated a negative 38% future net salvage ratio for the account as follows.

Table JSG-4
Account 380.20 Services Plant FNS Ratio
($millions)

1. Average Net Salvage 5-year average	**($5.6)**
2. Required Annual Accrual $	**$5.6**
3. Remaining Life	**30.9 years**
4. Total Future Net Salvage (L3XL2)	**($173.0)**
5. Plant Balance	**$456.3**
6. Net Salvage ratio (L4/L5)	**(38)%**

Q. DOES YOUR APPROACH ACCOUNT FOR INFLATION?

A. Yes, my approach does account for inflation because it is a rate (%) that is applied to annual plant balances which are in turn affected by inflation. Thus, my approach accounts for inflation as it is incurred. In response to data request CURB-070 the company stated, "The Company would expect to continue to incur, as it has in the past, the cost of removal with increasing labor rates." The same labor rates that affect the plant balance also affect cost of removal.

Q. DO YOU HAVE ANY ADDITIONAL COMMENTS?

A. Yes, I have used the methodology discussed above for all accounts, with one exception. I am proposing that the net salvage methodology calculated for Account 380.20 Services – Plastic also be utilized for Account 380.10 Services – Metallic. Account 380.10 Services – Metallic, has some very unusual characteristics that make this exception appropriate. In the first place, KGS's unadjusted net salvage record shows a five-year average net salvage of ($6,385,887). The total future net salvage, based on the remaining life of 26.8 would be

($171,077,918). Based on a remaining plant in service balance of $31,584,806. This would result in a net salvage ratio of (542)%. This is not a reasonable expectation of future net salvage given that the Company is in the process of removing the metallic services in its service area and replacing these with plastic services.

Q. IN WHAT WAYS IS YOUR PROPOSED METHODOLOGY SUPERIOR TO THE METHODOLOGY PROPOSED BY DR. WHITE?

A. The principle way in which this methodology is superior to the Company's proposed methodology is that it effectively matches the Company's depreciation rate to the costs incurred by the Company. Setting aside for a moment my other criticisms of the Company's methodology, the overarching problem is that the Company's methodology is an estimate of costs that it will not incur for many years, and in some cases decades. By its very nature, projecting costs decades into the future carries significant inherent uncertainty. In contrast, utilizing the five-year average of incurred net salvage ensures that a company is regularly compensated for their net salvage costs because its net salvage accruals are directly tied to its incurred net salvage. Using the five-year average would also ensure that charges to distribution customers closely equate to the Company's actual expenditures, therefore ensuring that customers are not being overcharged for costs that may not be incurred, while ensuring that the Company collects enough to cover its actual costs of removal.

Q. WOULD YOU CONSIDER THE PRESENT VALUE METHODOLOGY A REASONABLE ALTERNATIVE?

A. Yes. If my proposed five-year average methodology is not accepted by the Commission, I would then recommend that use of the present value methodology for all accounts as a

reasonable alternative.

F. RESERVE ALLOCATION

Q. CAN YOU EXPLAIN WHAT THE DEPRECIATION RESERVE IS?

A. Yes. The depreciation reserve, sometimes referred to as the book reserve, is essentially the amount that the Company has *already accrued* in depreciation for its current plant. This amount is subtracted from plant in service to arrive at future accruals. Entries in the depreciation reserve are recorded each year to account for depreciation accruals, cost of removal, gross salvage, and retirements, to ensure that the depreciation reserve is accurate.

Q. CAN YOU EXPLAIN THE PROCESS OF RESERVE REALLOCATION (OR REBALANCING)?

A. Yes. Dr. White has calculated a *theoretical reserve* for each account. A theoretical reserve calculation is an estimate of what the Company's depreciation reserve *would be* under Dr. White's proposed parameters (i.e. service lives, net salvage ratios, final retirement date, interim retirements, etc.).

The purpose of calculating the theoretical reserve is to see what the balance of the various units and accounts *should be* in relation to one another. Using this theoretical reserve, the book reserve is then reallocated between the accounts so that the balance of the book reserve in each account matches the balance of the theoretical reserve.

As the name implies, a reserve reallocation does not change the total amount in the depreciation reserve, it only changes the *way* that that reserve is distributed between the various accounts.

Q. DO YOU AGREE WITH DR. WHITE'S RATIONALE FOR THE REALLOCATION?

A. No. Dr. White states that redistributing the recorded reserves is appropriate, because "offsetting reserve imbalances attributable to both the passage of time and parameter adjustments recommended in the current study should be realigned among primary accounts to reduce offsetting imbalances and increase rate stability." He further states that the beginning of reserve redistribution is recommended because he is recommending beginning amortization accounting for Account 376.90. However, neither of these reasons necessitates the redistribution of depreciation reserves.

Q. ARE THERE DRAWBACKS IF THE COMMISSION WERE TO ADOPT DR. WHITE'S RECOMMENDATION TO REALLOCATE (OR REDISTRIBUTE) THE RESERVE ALLOCATIONS AND THEREBY "REBALANCE" THEM?

A. Yes. In general, I am opposed to this type of reserve reallocation, because it frequently obfuscates problems that exist within the Company's existing depreciation parameters. If book reserves are recorded normally, the book reserve can occasionally be tested against a theoretical reserve to demonstrate where a particular account has been under-depreciated or over-depreciated, and measures can be taken to address that imbalance by adjusting the depreciation parameters, either the average service life or the net salvage ratio for that account.

Moreover, one of the benefits of utilizing remaining life depreciation calculations is that these types of imbalances within a given account will work themselves out. If an account has been over-depreciated, this will be reflected in lower depreciation rates going forward and visa-versa.

Reallocating the book reserve simply papers over the underlying causes of these types of imbalances, without addressing the underlying cause of them, and worse, interferes with the normal course of remaining life calculations in balancing themselves out.

Q. CAN YOU PROVIDE A SUMMARY OF YOUR RECOMMENDATIONS?

A. Yes. I am proposing to adjust the average service life and retirement curve of nine different accounts. I am proposing to use the Broad Group procedure for calculating remaining lives for each account. I am proposing to use the five-year average methodology for estimating future net salvage. Finally, I am proposing to reject the redistrubtion of the Company's depreciation reserve. These adjustments result in a lower depreciation rate from Dr. White's proposed composite rate of 3.27% to 2.89% and lower accrual from $59,826,002 to $52,910,807 for a total accrual reduction of $6,915,295.

Q. DOES THIS CONCLUDE YOUR TESTIMONY?

A. Yes.

VERIFICATION

STATE OF MARYLAND)
)
COUNTY OF PRINCE GEORGE) ss:

James S. Garren, being duly sworn upon his oath, deposes and states that he is a consultant for the Citizens' Utility Ratepayer Board, that he has read and is familiar with the foregoing Direct Testimony, and that the statements made herein are true and correct to the best of his knowledge, information, and belief.

James S. Garren

SUBSCRIBED AND SWORN to before me this 29th day of October, 2018.

Notary Public

NASAHA THORPE NOTARY PUBLIC EXP. 6-30-20 DISTRICT OF COLUMBIA

My Commission expires: June 30, 2020

District of Columbia: SS
Subscribed and sworn to before me, in my presence,
this 29th day of October, 2018

Nasaha Thorpe, Notary Public, D.C.
My commission expires June 30, 2020.

KANSAS GAS SERVICE
2018 Study Year
December 31, 2017

Account Description	Plant Balance 12/31/2017 (1)	Net Salvage Ratio (2) (2) = (3) / (1)	Total Future Net Salvage (3)	Depreciation Reserve (4)	Future Accruals (5) (5) = (1) - (3) - (4)	Remaining Life (6)	Annual Depreciation Accrual (7) (7) = (5) / (6)	Depreciation Rate (8) (8) = (7) / (1)
TRANSMISSION PLANT								
365.20 Rights of Way	12,010,820	-	-	3,666,257	8,344,563	55.05	151,582	1.26%
366.10 Compressor Station Structures	4,751,256	(0)	(1,013,980)	3,883,807	1,881,429	27.6	68,168	1.43%
366.20 Meas. and Reg. Station Structures	1,394,765	(5)	(72,906)	1,052,833	414,838	41.58	9,977	0.72%
367.00 Mains	217,770,393	(11)	(23,660,321)	59,909,574	181,521,140	40.79	4,450,138	2.04%
368.00 Compressor Station Equipment	18,464,522	(17)	(3,183,272)	14,438,494	7,209,300	25.21	285,970	1.55%
369.00 Meas. and Reg. Station Equipment	21,040,060	(6)	(1,229,077)	6,130,307	16,138,830	32.55	495,817	2.36%
Total Transmission Plant	275,431,816	-	-	89,081,272	186,350,544		5,461,651	1.98%
DISTRIBUTION PLANT								
374.20 Rights of Way	2,218,337	(0)	(6,068)	548,718	1,675,687	57.03	29,383	1.32%
375.00 Structures and Improvements	890,099	-	-	458,324	431,775	22.94	18,822	2.11%
376.10 Mains - Metallic	288,773,291	(76)	(218,727,936)	88,533,063	418,968,164	52.5	7,980,346	2.76%
376.20 Mains - Plastic	338,177,359	(7)	(24,620,389)	118,359,483	244,438,265	31.54	7,750,104	2.29%
376.90 Mains - Cathodic Protection	30,194,962	-	-	954,707	29,240,255	8.16	1,950,595	6.46%
378.00 Meas. and Reg. Station Equip. - General	24,435,280	(10)	(2,541,415)	11,395,473	15,581,221	40.63	383,491	1.57%
379.00 Meas. and Reg. Station Equip. - City Gate	8,600,727	(40)	(3,462,770)	4,231,001	7,832,496	47.16	166,083	1.93%
380.10 Services - Metallic	31,584,806	(38) *	(12,119,422)	(2,316,921)	46,021,149	26.79	1,717,848	5.44%
380.20 Services - Plastic	456,336,500	(38)	(175,101,110)	182,453,155	448,984,456	30.9	14,530,241	3.18%
381.00 Meters	122,855,513	(1)	(1,543,687)	29,279,942	95,119,258	27.82	3,419,096	2.78%
381.50 AMR Communication Devices	23,735,492	-	-	6,840,853	16,894,639	8.48	1,583,157	6.67%
382.00 Meter Installations	92,316,838	(22)	(20,246,238)	30,875,126	81,687,950	35.94	2,272,898	2.46%
383.00 House Regulators and Installations	23,805,753	(7)	(1,664,598)	7,720,503	17,749,847	41.47	428,017	1.80%
386.00 Other Property - Customer Premises	224,125	-	-	224,125	0	1.04	0	0.00%
Total Distribution Plant	1,444,149,082	-	-	479,557,553	964,591,529		42,230,080	2.92%
GENERAL PLANT								
Depreciable								
390.10 Structures and Improvements	36,120,293	-		12,336,049	23,784,244	43.87	542,153	1.50%
392.00 Transportation Equipment	30,565,567	-		11,967,723	18,597,844	9.45	1,968,026	6.44%
396.00 Power Operated Equipment	12,905,334	-		7,317,522	5,587,812	10.47	533,697	4.14%
Total Depreciable	79,591,194	-		31,621,294	47,969,900		3,043,876	
Amortizable								
391.10 Office Furniture and Equipment	5,429,965			2,667,077	2,762,888	8.67	260,095	4.79%
391.25 Computer Equipment	6,369,882			5,527,516	842,366	2.86	892,420	14.01%
393.00 Stores Equipment	179,301			(75,712)	255,013	12.63	8,750	4.88%
394.00 Tools, Shop and Garage Equipment	10,670,287			1,704,296	8,965,991	8.23	697,837	6.54%
395.00 Laboratory Equipment	185,795			(222,523)	408,318	10.73	12,393	6.67%
397.00 Communication Equipment	5,354,142			2,330,843	3,023,299	4.22	285,911	5.34%
398.00 Miscellaneous Equipment	355,877			131,548	224,329	13.5	17,794	5.00%
Total Amortizable	28,545,249			12,063,045	16,482,204		2,175,200	
Total General Plant	108,136,443			43,684,339	128,904,208		5,219,076	4.83%
TOTAL GAS UTILITY	1,827,717,341			612,323,165	2,919,981,542		52,910,807	2.89%

KANSAS GAS SERVICE
2018 Study Year
December 31, 2017
Calculation of Future Net Salvage based on 5-Year Historical Average

		2013	2014	2015	2016	2017	5-Year Avg.	Remaining Life	Total Future NS
TRANSMISSION PLANT									
365.20	Rights of Way	-	-	-	-	-	-	55.05	-
366.10	Compressor Station Structures	(4,863)	(138,811)	-	(40,018)	-	(36,738)	27.6	(1,013,980)
366.20	Meas. and Reg. Station Structures	-	-	(3,857)	(4,910)	-	(1,753)	41.58	(72,906)
367.00	Mains	(989,092)	(443,121)	(789,601)	(92,233)	(586,213)	(580,052)	40.79	(23,660,321)
368.00	Compressor Station Equipment	(88,030)	(37,142)	679	(482,785)	(24,073)	(126,270)	25.21	(3,183,272)
369.00	Meas. and Reg. Station Equipment	(30,514)	(28,772)	(30,401)	(99,897)	(8,202)	(37,760)	32.55	(1,229,077)
	Total Transmission Plant								
DISTRIBUTION PLANT									
374.20	Rights of Way	(532)	-	-	-	-	(106)	57.03	(6,068)
375.00	Structures and Improvements	-	-	-	-	-	-	22.94	-
376.10	Mains - Metallic	(3,977,010)	(4,907,663)	(2,682,057)	(4,735,985)	(4,528,517)	(4,166,246)	52.5	(218,727,936)
376.20	Mains - Plastic	(706,232)	(782,384)	(799,357)	(1,038,434)	(576,635)	(780,608)	31.54	(24,620,389)
376.90	Mains - Cathodic Protection	-	-	-	-	-	-	8.16	-
378.00	Meas. and Reg. Station Equip. - General	(51,364)	(23,179)	(34,823)	(147,639)	(55,746)	(62,550)	40.63	(2,541,415)
379.00	Meas. and Reg. Station Equip. - City Gate	(152,485)	(91,854)	(1,341)	(8,541)	(112,909)	(73,426)	47.16	(3,462,770)
380.10	Services - Metallic	(4,023,237)	(9,730,942)	(3,283,983)	(9,585,771)	(5,305,503)	(6,385,887)	26.79	(171,077,918)
380.20	Services - Plastic	(6,240,227)	(2,467,614)	(4,100,056)	(9,199,131)	(6,326,485)	(5,666,703)	30.9	(175,101,110)
381.00	Meters	(119,008)	(7,778)	(885)	(140,485)	(9,286)	(55,488)	27.82	(1,543,687)
381.50	AMR Communication Devices	-	-	-	-	-	-	8.48	-
382.00	Meter Installations	(868,973)	(770,240)	(172,868)	(537,378)	(467,213)	(563,334)	35.94	(20,246,238)
383.00	House Regulators and Installations	(12,129)	(13,987)	(12,485)	(147,419)	(14,679)	(40,140)	41.47	(1,664,598)
386.00	Other Property - Customer Premises	-	-	-	-	-	-	1.04	-
	Total Distribution Plant								
GENERAL PLANT									
	Depreciable								
390.10	Structures and Improvements	(1,250)	-	-	-	201,669	40,084		
392.00	Transportation Equipment	429,769	364,993	-	307,412	(42,719)	211,891		
396.00	Power Operated Equipment	51,747	-	-	328	(58,079)	(1,201)		

KGS 2017

365.20 -

Calculation of Remaining Life
Based Upon Broad Group/Vintage Group Procedures
Related to Original Cost as of December 31, 2017

Survivor Curve .. IOWA: 70 R1.5

			BG/VG Average			
		Surviving	Service	Remaining	ASL	RL
Year	Age	Investment	Life	Life	Weights	Weights
(1)	(2)	(3)	(4)	(5)	(6)=(3)/(4)	(7)=(6)*(5)
2017	0.5	226,807	70.00	69.59	3,240	225,467
2016	1.5	203,235	70.00	68.76	2,903	199,646
2015	2.5	105,482	70.00	67.95	1,507	102,386
2014	3.5	0	70.00	67.13	0	0
2013	4.5	34,301	70.00	66.32	490	32,497
2012	5.5	23,712	70.00	65.51	339	22,191
2011	6.5	899,393	70.00	64.70	12,848	831,341
2010	7.5	0	70.00	63.90	0	0
2009	8.5	49,911	70.00	63.10	713	44,993
2008	9.5	148,761	70.00	62.31	2,125	132,412
2007	10.5	29,398	70.00	61.51	420	25,834
2006	11.5	485,390	70.00	60.73	6,934	421,081
2005	12.5	443,545	70.00	59.94	6,336	379,801
2004	13.5	351,798	70.00	59.16	5,026	297,309
2003	14.5	2,053,151	70.00	58.38	29,331	1,712,303
2002	15.5	741,328	70.00	57.60	10,590	610,046
2001	16.5	2,134	70.00	56.83	30	1,733
2000	17.5	2,046,874	70.00	56.06	29,241	1,639,337
1999	18.5	498,683	70.00	55.30	7,124	393,945
1998	19.5	449,052	70.00	54.54	6,415	349,850
1997	20.5	35,100	70.00	53.78	501	26,966
1996	21.5	30,203	70.00	53.02	431	22,878
1995	22.5	249,526	70.00	52.27	3,565	186,329
1994	23.5	454,103	70.00	51.52	6,487	334,244
1993	24.5	435,478	70.00	50.78	6,221	315,904
1992	25.5	84,460	70.00	50.04	1,207	60,376
1991	26.5	161,224	70.00	49.30	2,303	113,553
1990	27.5	22,100	70.00	48.57	316	15,334
1989	28.5	451,558	70.00	47.84	6,451	308,617
1988	29.5	45,448	70.00	47.12	649	30,591

1987	30.5	40,170	70.00	46.40	574	26,625
1986	31.5	41,783	70.00	45.68	597	27,266
1985	32.5	18,355	70.00	44.97	262	11,792
1984	33.5	62,583	70.00	44.26	894	39,572
1983	34.5	22,769	70.00	43.56	325	14,169
1982	35.5	180,715	70.00	42.86	2,582	110,656
1981	36.5	10,180	70.00	42.17	145	6,133
1980	37.5	4,790	70.00	41.48	68	2,838
1979	38.5	10,992	70.00	40.80	157	6,407
1978	39.5	307	70.00	40.12	4	176
1977	40.5	1,211	70.00	39.45	17	682
1976	41.5	11,777	70.00	38.79	168	6,526
1975	42.5	642	70.00	38.12	9	350
1974	43.5	7,009	70.00	37.47	100	3,752
1973	44.5	476	70.00	36.82	7	250
1972	45.5	28,783	70.00	36.18	411	14,875
1971	46.5	414,825	70.00	35.54	5,926	210,612
1970	47.5	65	70.00	34.91	1	32
1969	48.5	6,666	70.00	34.28	95	3,265
1968	49.5	14,730	70.00	33.66	210	7,084
1967	50.5	6,449	70.00	33.05	92	3,045
1966	51.5	5,581	70.00	32.45	80	2,587
1965	52.5	27,326	70.00	31.85	390	12,432
1964	53.5	3,337	70.00	31.26	48	1,490
1963	54.5	11,280	70.00	30.67	161	4,942
1962	55.5	1,953	70.00	30.09	28	839
1961	56.5	58	70.00	29.52	1	24
1960	57.5	0	70.00	28.95	0	0
1959	58.5	4,767	70.00	28.39	68	1,934
1958	59.5	4,059	70.00	27.84	58	1,615
1957	60.5	7,795	70.00	27.30	111	3,040
1956	61.5	4,465	70.00	26.76	64	1,707
1955	62.5	14,026	70.00	26.23	200	5,257
1954	63.5	15,054	70.00	25.71	215	5,530
1953	64.5	60,941	70.00	25.20	871	21,937
1952	65.5	0	70.00	24.69	0	0
1951	66.5	665	70.00	24.19	9	230
1950	67.5	11,512	70.00	23.70	164	3,898
1949	68.5	16,223	70.00	23.22	232	5,380
1948	69.5	7,567	70.00	22.74	108	2,458
1947	70.5	4,591	70.00	22.27	66	1,460
1946	71.5	0	70.00	21.81	0	0
1945	72.5	294	70.00	21.35	4	90
1944	73.5	0	70.00	20.90	0	0
1943	74.5	0	70.00	20.47	0	0
1942	75.5	697	70.00	20.03	10	200
1941	76.5	1,715	70.00	19.61	25	480

1940	77.5	0	70.00	19.19	0	0
1939	78.5	0	70.00	18.78	0	0
1938	79.5	268	70.00	18.38	4	70
1937	80.5	0	70.00	17.98	0	0
1936	81.5	2,455	70.00	17.59	35	617
1935	82.5	6,203	70.00	17.21	89	1,525
1934	83.5	49	70.00	16.83	1	12
1933	84.5	0	70.00	16.46	0	0
1932	85.5	292	70.00	16.10	4	67
1931	86.5	13,220	70.00	15.74	189	2,972
1930	87.5	25,084	70.00	15.39	358	5,513
1929	88.5	90,182	70.00	15.04	1,288	19,374
1928	89.5	17,949	70.00	14.70	256	3,769
1927	90.5	3,780	70.00	14.36	54	775
		12,010,820			171,583	9,445,297

AVERAGE SERVICE LIFE	70.00
AVERAGE REMAINING LIFE	55.05

KGS 2017

366.10 - Compressor Station Structures

Calculation of Remaining Life
Based Upon Broad Group/Vintage Group Procedures
Related to Original Cost as of December 31, 2017

Survivor Curve .. IOWA: 45 L2

			BG/VG Average			
		Surviving	Service	Remaining	ASL	RL
Year	Age	Investment	Life	Life	Weights	Weights
(1)	(2)	(3)	(4)	(5)	(6)=(3)/(4)	(7)=(6)*(5)
2017	0.5	156,701	45.00	44.49	3,482	154,936
2016	1.5	229,553	45.00	43.50	5,101	221,878
2015	2.5	57,157	45.00	42.50	1,270	53,984
2014	3.5	34,207	45.00	41.52	760	31,559
2013	4.5	0	45.00	40.54	0	0
2012	5.5	0	45.00	39.57	0	0
2011	6.5	0	45.00	38.62	0	0
2010	7.5	192,568	45.00	37.68	4,279	161,251
2009	8.5	0	45.00	36.76	0	0
2008	9.5	0	45.00	35.85	0	0
2007	10.5	0	45.00	34.95	0	0
2006	11.5	0	45.00	34.07	0	0
2005	12.5	22,412	45.00	33.20	498	16,537
2004	13.5	0	45.00	32.35	0	0
2003	14.5	98,957	45.00	31.51	2,199	69,301
2002	15.5	1,092,373	45.00	30.69	24,275	745,044
2001	16.5	0	45.00	29.89	0	0
2000	17.5	24,964	45.00	29.10	555	16,146
1999	18.5	1,389	45.00	28.35	31	875
1998	19.5	824,328	45.00	27.62	18,318	505,885
1997	20.5	3,844	45.00	26.92	85	2,299
1996	21.5	2,182	45.00	26.25	48	1,273
1995	22.5	0	45.00	25.62	0	0
1994	23.5	79,029	45.00	25.02	1,756	43,933
1993	24.5	135,940	45.00	24.45	3,021	73,855
1992	25.5	252,444	45.00	23.91	5,610	134,145
1991	26.5	222,354	45.00	23.41	4,941	115,659
1990	27.5	0	45.00	22.93	0	0
1989	28.5	394,678	45.00	22.48	8,771	197,198
1988	29.5	436,147	45.00	22.06	9,692	213,831

1987	30.5	0	45.00	21.66	0	0
1986	31.5	6,823	45.00	21.29	152	3,228
1985	32.5	1,211	45.00	20.93	27	563
1984	33.5	16,818	45.00	20.60	374	7,698
1983	34.5	7,161	45.00	20.28	159	3,227
1982	35.5	0	45.00	19.97	0	0
1981	36.5	343	45.00	19.68	8	150
1980	37.5	0	45.00	19.40	0	0
1979	38.5	0	45.00	19.13	0	0
1978	39.5	0	45.00	18.86	0	0
1977	40.5	0	45.00	18.61	0	0
1976	41.5	413	45.00	18.36	9	169
1975	42.5	2,439	45.00	18.11	54	982
1974	43.5	242	45.00	17.87	5	96
1973	44.5	0	45.00	17.63	0	0
1972	45.5	2,600	45.00	17.39	58	1,004
1971	46.5	4,129	45.00	17.15	92	1,573
1970	47.5	75,091	45.00	16.91	1,669	28,213
1969	48.5	148	45.00	16.67	3	55
1968	49.5	793	45.00	16.43	18	290
1967	50.5	410	45.00	16.18	9	147
1966	51.5	1,174	45.00	15.94	26	416
1965	52.5	2,518	45.00	15.70	56	878
1964	53.5	63,254	45.00	15.45	1,406	21,716
1963	54.5	10,768	45.00	15.20	239	3,637
1962	55.5	0	45.00	14.95	0	0
1961	56.5	0	45.00	14.70	0	0
1960	57.5	306	45.00	14.45	7	98
1959	58.5	0	45.00	14.20	0	0
1958	59.5	0	45.00	13.95	0	0
1957	60.5	0	45.00	13.69	0	0
1956	61.5	0	45.00	13.44	0	0
1955	62.5	2,686	45.00	13.19	60	787
1954	63.5	0	45.00	12.94	0	0
1953	64.5	270,597	45.00	12.69	6,013	76,295
1952	65.5	0	45.00	12.44	0	0
1951	66.5	320	45.00	12.19	7	87
1950	67.5	423	45.00	11.95	9	112
1949	68.5	0	45.00	11.70	0	0
1948	69.5	0	45.00	11.46	0	0
1947	70.5	0	45.00	11.22	0	0
1946	71.5	0	45.00	10.98	0	0
1945	72.5	0	45.00	10.75	0	0
1944	73.5	0	45.00	10.51	0	0
1943	74.5	0	45.00	10.28	0	0
1942	75.5	0	45.00	10.05	0	0
1941	76.5	0	45.00	9.83	0	0

1940	77.5	0	45.00	9.60	0	0
1939	78.5	0	45.00	9.38	0	0
1938	79.5	0	45.00	9.16	0	0
1937	80.5	0	45.00	8.94	0	0
1936	81.5	0	45.00	8.72	0	0
1935	82.5	0	45.00	8.50	0	0
1934	83.5	0	45.00	8.29	0	0
1933	84.5	0	45.00	8.08	0	0
1932	85.5	0	45.00	7.87	0	0
1931	86.5	0	45.00	7.66	0	0
1930	87.5	19,363	45.00	7.46	430	3,208
		4,751,256			105,583	2,914,217

AVERAGE SERVICE LIFE	45.00
AVERAGE REMAINING LIFE	27.60

KGS 2017

366.20 - Meas. and Reg. Station Structures

Calculation of Remaining Life
Based Upon Broad Group/Vintage Group Procedures
Related to Original Cost as of December 31, 2017

Survivor Curve .. IOWA: 60 S0.5

			BG/VG Average			
Year	Age	Surviving Investment	Service Life	Remaining Life	ASL Weights	RL Weights
(1)	(2)	(3)	(4)	(5)	(6)=(3)/(4)	(7)=(6)*(5)
2017	0.5	28,437	60.00	59.50	474	28,201
2016	1.5	19,357	60.00	58.53	323	18,883
2015	2.5	170,559	60.00	57.58	2,843	163,669
2014	3.5	0	60.00	56.64	0	0
2013	4.5	28,287	60.00	55.72	471	26,270
2012	5.5	0	60.00	54.82	0	0
2011	6.5	12,286	60.00	53.93	205	11,043
2010	7.5	0	60.00	53.06	0	0
2009	8.5	0	60.00	52.20	0	0
2008	9.5	0	60.00	51.35	0	0
2007	10.5	0	60.00	50.52	0	0
2006	11.5	0	60.00	49.70	0	0
2005	12.5	0	60.00	48.90	0	0
2004	13.5	38,110	60.00	48.10	635	30,555
2003	14.5	31,110	60.00	47.33	519	24,538
2002	15.5	14,499	60.00	46.56	242	11,251
2001	16.5	0	60.00	45.80	0	0
2000	17.5	1,576	60.00	45.06	26	1,184
1999	18.5	5,461	60.00	44.33	91	4,035
1998	19.5	59,211	60.00	43.61	987	43,040
1997	20.5	101,200	60.00	42.91	1,687	72,366
1996	21.5	14,309	60.00	42.21	238	10,066
1995	22.5	55,646	60.00	41.52	927	38,509
1994	23.5	17,849	60.00	40.85	297	12,151
1993	24.5	15,153	60.00	40.18	253	10,148
1992	25.5	30,901	60.00	39.53	515	20,357
1991	26.5	71,663	60.00	38.88	1,194	46,438
1990	27.5	88,685	60.00	38.24	1,478	56,528
1989	28.5	87,965	60.00	37.62	1,466	55,151
1988	29.5	84,946	60.00	37.00	1,416	52,384

1987	30.5	51,084	60.00	36.39	851	30,983
1986	31.5	61,314	60.00	35.79	1,022	36,576
1985	32.5	72,653	60.00	35.20	1,211	42,623
1984	33.5	42,648	60.00	34.62	711	24,606
1983	34.5	61,843	60.00	34.04	1,031	35,088
1982	35.5	47,632	60.00	33.47	794	26,574
1981	36.5	7,341	60.00	32.91	122	4,027
1980	37.5	6,132	60.00	32.36	102	3,308
1979	38.5	411	60.00	31.82	7	218
1978	39.5	0	60.00	31.28	0	0
1977	40.5	5,375	60.00	30.75	90	2,754
1976	41.5	0	60.00	30.23	0	0
1975	42.5	0	60.00	29.71	0	0
1974	43.5	1,971	60.00	29.20	33	959
1973	44.5	196	60.00	28.69	3	94
1972	45.5	0	60.00	28.19	0	0
1971	46.5	2,261	60.00	27.70	38	1,044
1970	47.5	0	60.00	27.21	0	0
1969	48.5	1,885	60.00	26.73	31	840
1968	49.5	303	60.00	26.26	5	132
1967	50.5	6,306	60.00	25.79	105	2,710
1966	51.5	928	60.00	25.32	15	392
1965	52.5	995	60.00	24.86	17	412
1964	53.5	5,379	60.00	24.41	90	2,188
1963	54.5	5,810	60.00	23.96	97	2,319
1962	55.5	4,308	60.00	23.51	72	1,688
1961	56.5	4,080	60.00	23.07	68	1,569
1960	57.5	833	60.00	22.63	14	314
1959	58.5	0	60.00	22.20	0	0
1958	59.5	1,193	60.00	21.77	20	433
1957	60.5	3,077	60.00	21.35	51	1,095
1956	61.5	1,080	60.00	20.93	18	377
1955	62.5	2,903	60.00	20.51	48	993
1954	63.5	8,039	60.00	20.10	134	2,693
1953	64.5	3,470	60.00	19.69	58	1,139
1952	65.5	0	60.00	19.29	0	0
1951	66.5	1,614	60.00	18.89	27	508
1950	67.5	810	60.00	18.49	13	249
1949	68.5	625	60.00	18.09	10	189
1948	69.5	0	60.00	17.70	0	0
1947	70.5	549	60.00	17.31	9	158
1946	71.5	0	60.00	16.93	0	0
1945	72.5	0	60.00	16.55	0	0
1944	73.5	0	60.00	16.17	0	0
1943	74.5	0	60.00	15.79	0	0
1942	75.5	0	60.00	15.42	0	0
1941	76.5	169	60.00	15.04	3	42

1940	77.5	0	60.00	14.67	0	0
1939	78.5	0	60.00	14.31	0	0
1938	79.5	0	60.00	13.94	0	0
1937	80.5	60	60.00	13.58	1	14
1936	81.5	0	60.00	13.22	0	0
1935	82.5	82	60.00	12.86	1	17
1934	83.5	0	60.00	12.51	0	0
1933	84.5	0	60.00	12.16	0	0
1932	85.5	0	60.00	11.80	0	0
1931	86.5	289	60.00	11.45	5	55
1930	87.5	1,158	60.00	11.11	19	214
1929	88.5	424	60.00	10.76	7	76
1928	89.5	326	60.00	10.41	5	57
		1,394,765			23,246	966,493

AVERAGE SERVICE LIFE	60.00
AVERAGE REMAINING LIFE	41.58

Observed Life Table Results
Kansas Gas Service
Account: 367.00 - Mains

Age	Exposures	Retiremen	Retiremen Ratio (%)	Survivor Ratio (%)	Cumulative Survivors
BAND		1927 - 2017			
0	171,491,108	4,732	0.0028	99.9972	1.0000
0.5	173,185,601	100,873	0.0582	99.9418	1.0000
1.5	167,525,977	2,478,614	1.4795	98.5205	0.9994
2.5	171,935,351	1,657,061	0.9638	99.0362	0.9846
3.5	167,031,866	593,005	0.3550	99.6450	0.9751
4.5	161,871,139	590,601	0.3649	99.6351	0.9717
5.5	153,361,156	439,545	0.2866	99.7134	0.9681
6.5	130,695,176	661,106	0.5058	99.4942	0.9653
7.5	130,265,877	557,821	0.4282	99.5718	0.9604
8.5	130,366,362	427,887	0.3282	99.6718	0.9563
9.5	124,575,413	-406,750	-0.3265	100.3265	0.9532
10.5	121,077,744	741,944	0.6128	99.3872	0.9563
11.5	116,376,954	525,526	0.4516	99.5484	0.9505
12.5	112,200,308	347,453	0.3097	99.6903	0.9462
13.5	108,006,112	508,732	0.4710	99.5290	0.9432
14.5	100,204,143	387,928	0.3871	99.6129	0.9388
15.5	85,965,458	427,088	0.4968	99.5032	0.9352
16.5	85,303,135	284,405	0.3334	99.6666	0.9305
17.5	78,682,157	703,565	0.8942	99.1058	0.9274
18.5	63,935,783	417,985	0.6538	99.3462	0.9191
19.5	58,823,476	850,127	1.4452	98.5548	0.9131
20.5	57,474,727	555,724	0.9669	99.0331	0.8999
21.5	57,270,055	540,634	0.9440	99.0560	0.8912
22.5	53,044,490	573,459	1.0811	98.9189	0.8828
23.5	46,638,257	746,259	1.6001	98.3999	0.8732
24.5	41,743,357	736,980	1.7655	98.2345	0.8593
25.5	39,639,518	270,286	0.6819	99.3181	0.8441
26.5	36,670,581	1,495,978	4.0795	95.9205	0.8383
27.5	34,078,134	385,248	1.1305	98.8695	0.8041
28.5	30,997,458	108,984	0.3516	99.6484	0.7951
29.5	29,382,662	132,782	0.4519	99.5481	0.7923
30.5	33,294,757	153,933	0.4623	99.5377	0.7887
31.5	28,675,792	253,717	0.8848	99.1152	0.7850
32.5	28,302,590	366,171	1.2938	98.7062	0.7781
33.5	23,649,961	747,292	3.1598	96.8402	0.7680
34.5	20,956,362	275,508	1.3147	98.6853	0.7438
35.5	17,779,535	114,220	0.6424	99.3576	0.7340
36.5	18,309,497	205,939	1.1248	98.8752	0.7293
37.5	18,310,258	103,969	0.5678	99.4322	0.7211
38.5	18,537,031	984,024	5.3084	94.6916	0.7170

39.5	18,837,894	230,308	1.2226	98.7774	0.6789
40.5	19,276,563	585,656	3.0382	96.9618	0.6706
41.5	18,535,887	128,334	0.6924	99.3076	0.6502
42.5	18,441,482	298,099	1.6165	98.3835	0.6457
43.5	17,803,596	107,522	0.6039	99.3961	0.6353
44.5	17,624,053	525,103	2.9795	97.0205	0.6315
45.5	16,426,413	219,289	1.3350	98.6650	0.6126
46.5	9,856,272	211,980	2.1507	97.8493	0.6045
47.5	10,266,894	106,018	1.0326	98.9674	0.5915
48.5	10,503,537	149,823	1.4264	98.5736	0.5854
49.5	10,100,628	170,692	1.6899	98.3101	0.5770
50.5	9,559,492	182,125	1.9052	98.0948	0.5673
51.5	10,060,604	111,185	1.1052	98.8948	0.5564
52.5	13,207,552	298,912	2.2632	97.7368	0.5503
53.5	12,415,394	229,628	1.8495	98.1505	0.5378
54.5	11,604,250	375,487	3.2358	96.7642	0.5279
55.5	10,937,999	254,000	2.3222	97.6778	0.5108
56.5	10,664,912	1,067,607	10.0105	89.9895	0.4990
57.5	9,592,070	123,859	1.2913	98.7087	0.4490
58.5	9,385,552	207,156	2.2072	97.7928	0.4432
59.5	9,110,900	305,608	3.3543	96.6457	0.4334
60.5	8,777,308	400,940	4.5679	95.4321	0.4189
61.5	8,303,559	555,112	6.6852	93.3148	0.3998
62.5	7,578,113	34,085	0.4498	99.5502	0.3730
63.5	7,277,720	-10,081	-0.1385	100.1385	0.3713
64.5	5,909,018	-13,678	-0.2315	100.2315	0.3719
65.5	5,918,091	57,487	0.9714	99.0286	0.3727
66.5	5,590,734	211,140	3.7766	96.2234	0.3691
67.5	4,927,060	127,766	2.5931	97.4069	0.3552
68.5	1,304,698	3,193	0.2447	99.7553	0.3460
69.5	1,293,438	57,256	4.4267	95.5733	0.3451
70.5	1,235,273	41,893	3.3914	96.6086	0.3298
71.5	1,193,380	89,644	7.5118	92.4882	0.3186
72.5	2,420,785	63,197	2.6106	97.3894	0.2947
73.5	2,357,588	3,453	0.1465	99.8535	0.2870
74.5	2,329,822	149,220	6.4048	93.5952	0.2866
75.5	2,180,602	313,406	14.3725	85.6275	0.2682
76.5	1,852,677	979,211	52.8538	47.1462	0.2297
77.5	873,218	587,691	67.3018	32.6982	0.1083
78.5	285,526	12,097	4.2367	95.7633	0.0354
79.5	271,606	6,604	2.4314	97.5686	0.0339
80.5	265,002	33,001	12.4532	87.5468	0.0331
81.5	231,828	24,817	10.7049	89.2951	0.0290
82.5	196,122	21,284	10.8522	89.1478	0.0259
83.5	174,839	7,503	4.2914	95.7086	0.0231
84.5	147,701	0	0.0000	100.0000	0.0221
85.5	145,615	875	0.6006	99.3994	0.0221

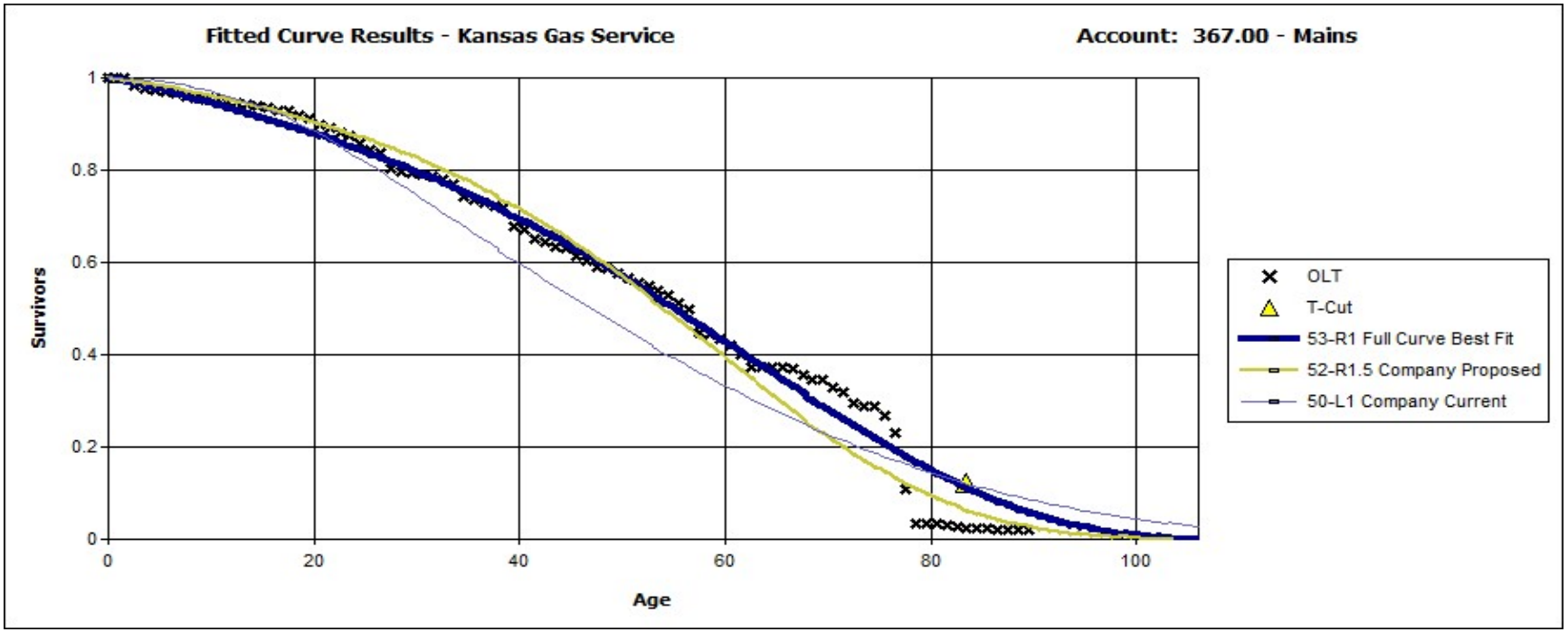
86.5	109,558	0	0.0000	100.0000	0.0219
87.5	47,442	0	0.0000	100.0000	0.0219
88.5	8,522	0	0.0000	100.0000	0.0219
89.5	0	0	0.0000	100.0000	0.0219

Best Fit Curve Results
Kansas Gas Service
Account: 367.00 - Mains

Curve	Life	Sum of Squared Differences
BAND	**1927 - 2017**	
R1	53.0	1,223.399
S0.5	54.0	1,548.327
R1.5	54.0	1,594.325
S0	53.0	1,604.376
S1	54.0	2,338.511
L1.5	56.0	2,385.483
R0.5	52.0	2,408.709
L1	56.0	2,435.896
S-0.5	53.0	2,735.499
R2	54.0	3,067.200
L0.5	56.0	3,228.190
L2	56.0	3,285.916
S1.5	55.0	3,853.178
L0	57.0	4,681.103
O1	52.0	5,092.481
R2.5	55.0	5,710.521
O2	59.0	5,895.759
S2	56.0	6,200.798
L3	56.0	7,467.031
R3	56.0	9,431.677
S3	56.0	12,480.410
O3	65.0	12,941.241
L4	56.0	15,729.178
R4	57.0	18,391.348
S4	57.0	22,853.833
L5	57.0	26,071.355
O4	65.0	27,167.412
R5	57.0	31,013.033
S5	57.0	34,088.247
S6	56.0	44,188.395
SQ	56.0	64,074.789

Analytical Parameters

OLT Placement Band:	1927 - 2017
OLT Experience Band:	1927 - 2017
Minimum Life Paramet	4
Maximum Life Parame	65
Life Increment Parame	1
Max Age (T-Cut):	83.5



Analytical Parameters

OLT Placement Band:	1927 - 2017
OLT Experience Band:	1927 - 2017
Minimum Life Parameter:	4
Maximum Life Parameter:	65
Life Increment Parameter:	1
Max Age (T-Cut):	85.0

KGS 2017

367.00 -

Calculation of Remaining Life
Based Upon Broad Group/Vintage Group Procedures
Related to Original Cost as of December 31, 2017

Survivor Curve .. IOWA: 53 R1

			BG/VG Average			
Year	Age	Surviving Investment	Service Life	Remaining Life	ASL Weights	RL Weights
(1)	(2)	(3)	(4)	(5)	(6)=(3)/(4)	(7)=(6)*(5)
2017	0.5	8,215,567	53.00	52.63	155,011	8,157,887
2016	1.5	5,496,565	53.00	51.89	103,709	5,381,315
2015	2.5	5,434,319	53.00	51.15	102,534	5,245,030
2014	3.5	5,400,133	53.00	50.42	101,889	5,137,597
2013	4.5	6,437,891	53.00	49.70	121,470	6,036,668
2012	5.5	8,601,425	53.00	48.97	162,291	7,948,131
2011	6.5	23,523,393	53.00	48.26	443,838	21,417,897
2010	7.5	3,055,416	53.00	47.54	57,649	2,740,742
2009	8.5	2,798,316	53.00	46.83	52,798	2,472,588
2008	9.5	5,836,201	53.00	46.12	110,117	5,078,996
2007	10.5	4,648,003	53.00	45.42	87,698	3,983,259
2006	11.5	5,086,257	53.00	44.72	95,967	4,291,640
2005	12.5	5,171,195	53.00	44.02	97,570	4,295,312
2004	13.5	6,055,573	53.00	43.33	114,256	4,950,625
2003	14.5	8,676,884	53.00	42.64	163,715	6,980,538
2002	15.5	17,986,343	53.00	41.95	339,365	14,236,518
2001	16.5	352,439	53.00	41.27	6,650	274,406
2000	17.5	9,936,359	53.00	40.58	187,478	7,608,424
1999	18.5	15,889,545	53.00	39.90	299,803	11,963,197
1998	19.5	6,363,807	53.00	39.23	120,072	4,710,082
1997	20.5	970,308	53.00	38.55	18,308	705,834
1996	21.5	147,688	53.00	37.88	2,787	105,566
1995	22.5	3,973,120	53.00	37.22	74,965	2,790,001
1994	23.5	6,073,139	53.00	36.55	114,588	4,188,734
1993	24.5	4,440,650	53.00	35.90	83,786	3,007,582
1992	25.5	1,816,096	53.00	35.24	34,266	1,207,578
1991	26.5	2,571,124	53.00	34.59	48,512	1,678,069
1990	27.5	1,239,079	53.00	33.95	23,379	793,604
1989	28.5	3,156,701	53.00	33.30	59,560	1,983,634
1988	29.5	2,509,659	53.00	32.67	47,352	1,546,930

1987	30.5	1,614,206	53.00	32.04	30,457	975,772
1986	31.5	4,470,983	53.00	31.41	84,358	2,649,912
1985	32.5	550,349	53.00	30.79	10,384	319,750
1984	33.5	4,511,241	53.00	30.18	85,118	2,568,727
1983	34.5	2,048,836	53.00	29.57	38,657	1,143,099
1982	35.5	2,926,870	53.00	28.97	55,224	1,599,706
1981	36.5	858,036	53.00	28.37	16,189	459,315
1980	37.5	421,359	53.00	27.78	7,950	220,867
1979	38.5	692,515	53.00	27.20	13,066	355,373
1978	39.5	305,045	53.00	26.62	5,756	153,214
1977	40.5	83,642	53.00	26.05	1,578	41,110
1976	41.5	451,273	53.00	25.48	8,515	216,991
1975	42.5	23,231	53.00	24.93	438	10,926
1974	43.5	494,411	53.00	24.37	9,329	227,382
1973	44.5	75,237	53.00	23.83	1,420	33,829
1972	45.5	714,242	53.00	23.29	13,476	313,888
1971	46.5	6,363,464	53.00	22.76	120,065	2,732,731
1970	47.5	20,360	53.00	22.24	384	8,542
1969	48.5	532,595	53.00	21.72	10,049	218,233
1968	49.5	257,353	53.00	21.20	4,856	102,966
1967	50.5	396,399	53.00	20.70	7,479	154,817
1966	51.5	86,043	53.00	20.20	1,623	32,795
1965	52.5	240,044	53.00	19.71	4,529	89,261
1964	53.5	358,739	53.00	19.22	6,769	130,108
1963	54.5	577,337	53.00	18.74	10,893	204,166
1962	55.5	290,765	53.00	18.27	5,486	100,228
1961	56.5	19,087	53.00	17.80	360	6,411
1960	57.5	4,521	53.00	17.34	85	1,479
1959	58.5	82,660	53.00	16.89	1,560	26,336
1958	59.5	67,496	53.00	16.44	1,274	20,933
1957	60.5	28,176	53.00	15.99	532	8,503
1956	61.5	72,809	53.00	15.56	1,374	21,373
1955	62.5	171,595	53.00	15.13	3,238	48,975
1954	63.5	266,308	53.00	14.70	5,025	73,869
1953	64.5	1,378,783	53.00	14.28	26,015	371,531
1952	65.5	4,604	53.00	13.87	87	1,205
1951	66.5	269,870	53.00	13.46	5,092	68,530
1950	67.5	452,534	53.00	13.06	8,538	111,473
1949	68.5	3,496,722	53.00	12.66	65,976	835,098
1948	69.5	8,067	53.00	12.27	152	1,867
1947	70.5	909	53.00	11.88	17	204
1946	71.5	0	53.00	11.50	0	0
1945	72.5	59	53.00	11.12	1	12
1944	73.5	0	53.00	10.75	0	0
1943	74.5	24,313	53.00	10.38	459	4,761
1942	75.5	0	53.00	10.02	0	0
1941	76.5	14,519	53.00	9.66	274	2,646

1940	77.5	247	53.00	9.30	5	43
1939	78.5	0	53.00	8.96	0	0
1938	79.5	1,824	53.00	8.61	34	296
1937	80.5	0	53.00	8.27	0	0
1936	81.5	173	53.00	7.94	3	26
1935	82.5	10,889	53.00	7.61	205	1,563
1934	83.5	0	53.00	7.28	0	0
1933	84.5	19,635	53.00	6.96	370	2,579
1932	85.5	2,086	53.00	6.64	39	261
1931	86.5	35,182	53.00	6.33	664	4,201
1930	87.5	62,116	53.00	6.02	1,172	7,055
1929	88.5	38,919	53.00	5.71	734	4,196
1928	89.5	8,522	53.00	5.41	161	870
1927	90.5	0	53.00	5.11	0	0
		217,770,393			4,108,875	167,608,388

AVERAGE SERVICE LIFE	53.00
AVERAGE REMAINING LIFE	40.79

KGS 2017

368.00 -

Calculation of Remaining Life
Based Upon Broad Group/Vintage Group Procedures
Related to Original Cost as of December 31, 2017

Survivor Curve .. IOWA: 35 O1

			BG/VG Average			
Year	Age	Surviving Investment	Service Life	Remaining Life	ASL Weights	RL Weights
(1)	(2)	(3)	(4)	(5)	(6)=(3)/(4)	(7)=(6)*(5)
2017	0.5	27,188	35.00	34.75	777	26,996
2016	1.5	53,755	35.00	34.25	1,536	52,607
2015	2.5	347,300	35.00	33.75	9,923	334,921
2014	3.5	168,053	35.00	33.25	4,802	159,663
2013	4.5	373,240	35.00	32.75	10,664	349,273
2012	5.5	629,861	35.00	32.25	17,996	580,419
2011	6.5	303,086	35.00	31.75	8,660	274,965
2010	7.5	551,248	35.00	31.25	15,750	492,228
2009	8.5	66,306	35.00	30.75	1,894	58,260
2008	9.5	130,018	35.00	30.25	3,715	112,383
2007	10.5	121,713	35.00	29.75	3,478	103,466
2006	11.5	46,310	35.00	29.25	1,323	38,706
2005	12.5	86,344	35.00	28.75	2,467	70,933
2004	13.5	18,289	35.00	28.25	523	14,764
2003	14.5	35,897	35.00	27.75	1,026	28,464
2002	15.5	722,784	35.00	27.25	20,651	562,804
2001	16.5	149,161	35.00	26.75	4,262	114,015
2000	17.5	108,962	35.00	26.25	3,113	81,732
1999	18.5	2,684,438	35.00	25.75	76,698	1,975,234
1998	19.5	6,958,203	35.00	25.25	198,806	5,020,518
1997	20.5	0	35.00	24.75	0	0
1996	21.5	54,932	35.00	24.25	1,569	38,065
1995	22.5	252,621	35.00	23.75	7,218	171,447
1994	23.5	1,179,090	35.00	23.25	33,688	783,376
1993	24.5	146,063	35.00	22.75	4,173	94,956
1992	25.5	36,875	35.00	22.25	1,054	23,446
1991	26.5	299,119	35.00	21.75	8,546	185,915
1990	27.5	22,700	35.00	21.25	649	13,785
1989	28.5	1,227,924	35.00	20.75	35,084	728,128
1988	29.5	890,976	35.00	20.25	25,456	515,600

1987	30.5	289	35.00	19.75	8	163
1986	31.5	14,691	35.00	19.25	420	8,082
1985	32.5	158,576	35.00	18.75	4,531	84,972
1984	33.5	87,519	35.00	18.25	2,501	45,647
1983	34.5	47,613	35.00	17.75	1,360	24,153
1982	35.5	4,857	35.00	17.25	139	2,394
1981	36.5	1,381	35.00	16.76	39	661
1980	37.5	2,862	35.00	16.26	82	1,329
1979	38.5	86,256	35.00	15.76	2,464	38,828
1978	39.5	2,438	35.00	15.26	70	1,062
1977	40.5	647	35.00	14.76	18	273
1976	41.5	1,889	35.00	14.26	54	769
1975	42.5	0	35.00	13.76	0	0
1974	43.5	4,392	35.00	13.26	125	1,664
1973	44.5	0	35.00	12.76	0	0
1972	45.5	5,245	35.00	12.26	150	1,837
1971	46.5	4,470	35.00	11.76	128	1,501
1970	47.5	467	35.00	11.26	13	150
1969	48.5	0	35.00	10.76	0	0
1968	49.5	0	35.00	10.26	0	0
1967	50.5	303	35.00	9.76	9	84
1966	51.5	1,689	35.00	9.26	48	447
1965	52.5	0	35.00	8.76	0	0
1964	53.5	258,636	35.00	8.26	7,390	61,030
1963	54.5	42,708	35.00	7.76	1,220	9,468
1962	55.5	1,838	35.00	7.26	53	381
1961	56.5	7,743	35.00	6.76	221	1,496
1960	57.5	20,727	35.00	6.26	592	3,708
1959	58.5	0	35.00	5.76	0	0
1958	59.5	14,486	35.00	5.26	414	2,178
1957	60.5	0	35.00	4.76	0	0
1956	61.5	53	35.00	4.27	2	6
1955	62.5	0	35.00	3.77	0	0
1954	63.5	0	35.00	3.27	0	0
1953	64.5	0	35.00	2.77	0	0
1952	65.5	0	35.00	2.28	0	0
1951	66.5	0	35.00	1.79	0	0
1950	67.5	0	35.00	1.30	0	0
1949	68.5	0	35.00	0.83	0	0
1948	69.5	0	35.00	0.50	0	0
1947	70.5	242	35.00	0.50	7	3
1946	71.5	0	35.00	0.50	0	0
1945	72.5	0	35.00	0.50	0	0
1944	73.5	0	35.00	0.50	0	0
1943	74.5	0	35.00	0.50	0	0
1942	75.5	0	35.00	0.50	0	0
1941	76.5	0	35.00	0.50	0	0

1940	77.5	0	35.00	0.50	0	0
1939	78.5	0	35.00	0.50	0	0
1938	79.5	0	35.00	0.50	0	0
1937	80.5	0	35.00	0.50	0	0
1936	81.5	0	35.00	0.50	0	0
1935	82.5	0	35.00	0.50	0	0
1934	83.5	0	35.00	0.50	0	0
1933	84.5	0	35.00	0.50	0	0
1932	85.5	0	35.00	0.50	0	0
1931	86.5	0	35.00	0.50	0	0
1930	87.5	48	35.00	0.50	1	1
1929	88.5	0	35.00	0.50	0	0
		18,464,522			527,558	13,299,360

AVERAGE SERVICE LIFE	35.00
AVERAGE REMAINING LIFE	25.21

Observed Life Table Results
Kansas Gas Service
Account: 369.00 - Meas. and Reg. Station Equip.

Age	Exposures	Retiremen	Retirement Ratio (%)	Survivor Ratio (%)	Cumulative Survivors
BAND		1928 - 2017			
0	16,772,530	27,601	0.1646	99.8354	1.0000
0.5	17,055,512	92,777	0.5440	99.4560	0.9984
1.5	16,197,033	108,584	0.6704	99.3296	0.9929
2.5	18,060,137	116,048	0.6426	99.3574	0.9863
3.5	18,221,388	433,802	2.3807	97.6193	0.9799
4.5	16,510,863	291,829	1.7675	98.2325	0.9566
5.5	16,018,942	405,364	2.5305	97.4695	0.9397
6.5	15,144,707	156,385	1.0326	98.9674	0.9159
7.5	14,853,562	342,821	2.3080	97.6920	0.9065
8.5	14,452,075	47,737	0.3303	99.6697	0.8855
9.5	13,807,705	70,650	0.5117	99.4883	0.8826
10.5	10,790,623	25,502	0.2363	99.7637	0.8781
11.5	10,522,405	59,919	0.5694	99.4306	0.8760
12.5	9,821,218	46,848	0.4770	99.5230	0.8710
13.5	9,322,121	84,906	0.9108	99.0892	0.8669
14.5	9,069,035	60,458	0.6666	99.3334	0.8590
15.5	8,195,524	36,564	0.4461	99.5539	0.8533
16.5	8,215,983	73,460	0.8941	99.1059	0.8494
17.5	7,816,794	265,414	3.3954	96.6046	0.8419
18.5	5,935,539	18,752	0.3159	99.6841	0.8133
19.5	4,108,634	32,630	0.7942	99.2058	0.8107
20.5	4,415,746	121,842	2.7593	97.2407	0.8043
21.5	4,692,911	29,956	0.6383	99.3617	0.7821
22.5	4,327,809	31,920	0.7376	99.2624	0.7771
23.5	4,189,796	86,379	2.0617	97.9383	0.7713
24.5	3,826,621	31,865	0.8327	99.1673	0.7554
25.5	3,658,774	5,809	0.1588	99.8412	0.7492
26.5	3,250,638	36,585	1.1255	98.8745	0.7480
27.5	2,963,071	11,956	0.4035	99.5965	0.7395
28.5	2,299,488	49,627	2.1582	97.8418	0.7366
29.5	1,393,333	22,536	1.6174	98.3826	0.7207
30.5	1,198,029	18,518	1.5457	98.4543	0.7090
31.5	1,114,683	23,090	2.0714	97.9286	0.6980
32.5	844,621	52,036	6.1608	93.8392	0.6836
33.5	679,087	10,340	1.5226	98.4774	0.6415
34.5	548,169	8,248	1.5046	98.4954	0.6317
35.5	442,020	1,946	0.4402	99.5598	0.6222
36.5	414,149	3,117	0.7526	99.2474	0.6195
37.5	460,897	31,362	6.8045	93.1955	0.6148
38.5	469,988	101,080	21.5068	78.4932	0.5730

39.5	530,583	15,731	2.9649	97.0351	0.4497
40.5	505,495	31,685	6.2680	93.7320	0.4364
41.5	457,797	8,754	1.9123	98.0877	0.4091
42.5	441,526	17,402	3.9412	96.0588	0.4012
43.5	421,534	3,000	0.7118	99.2882	0.3854
44.5	412,462	30,078	7.2922	92.7078	0.3827
45.5	427,993	127,306	29.7449	70.2551	0.3548
46.5	317,430	1,221	0.3848	99.6152	0.2492
47.5	313,505	1,869	0.5962	99.4038	0.2483
48.5	308,897	17,662	5.7178	94.2822	0.2468
49.5	273,569	5,681	2.0765	97.9235	0.2327
50.5	238,457	5,031	2.1098	97.8902	0.2279
51.5	231,286	3,660	1.5825	98.4175	0.2231
52.5	261,082	2,555	0.9785	99.0215	0.2195
53.5	220,737	4,245	1.9229	98.0771	0.2174
54.5	176,946	824	0.4658	99.5342	0.2132
55.5	148,067	4,654	3.1430	96.8570	0.2122
56.5	139,912	5,109	3.6513	96.3487	0.2055
57.5	132,627	4,103	3.0933	96.9067	0.1980
58.5	127,891	1,748	1.3665	98.6335	0.1919
59.5	123,454	1,920	1.5554	98.4446	0.1893
60.5	116,346	3,768	3.2386	96.7614	0.1863
61.5	103,038	346	0.3361	99.6639	0.1803
62.5	95,285	1,533	1.6093	98.3907	0.1797
63.5	83,452	598	0.7166	99.2834	0.1768
64.5	74,689	37	0.0496	99.9504	0.1755
65.5	74,652	1,778	2.3818	97.6182	0.1754
66.5	15,713	1,242	7.9016	92.0984	0.1713
67.5	13,438	4	0.0316	99.9684	0.1577
68.5	13,434	91	0.6743	99.3257	0.1577
69.5	13,344	33	0.2464	99.7536	0.1566
70.5	13,011	0	0.0000	100.0000	0.1562
71.5	11,586	519	4.4753	95.5247	0.1562
72.5	11,333	392	3.4576	96.5424	0.1492
73.5	10,942	641	5.8542	94.1458	0.1441
74.5	10,156	848	8.3506	91.6494	0.1357
75.5	9,308	0	0.0000	100.0000	0.1243
76.5	9,130	673	7.3693	92.6307	0.1243
77.5	8,457	0	0.0000	100.0000	0.1152
78.5	8,457	0	0.0000	100.0000	0.1152
79.5	8,457	137	1.6162	98.3838	0.1152
80.5	8,152	0	0.0000	100.0000	0.1133
81.5	8,139	0	0.0000	100.0000	0.1133
82.5	8,099	0	0.0000	100.0000	0.1133
83.5	8,099	0	0.0000	100.0000	0.1133
84.5	8,099	0	0.0000	100.0000	0.1133
85.5	8,099	0	0.0000	100.0000	0.1133

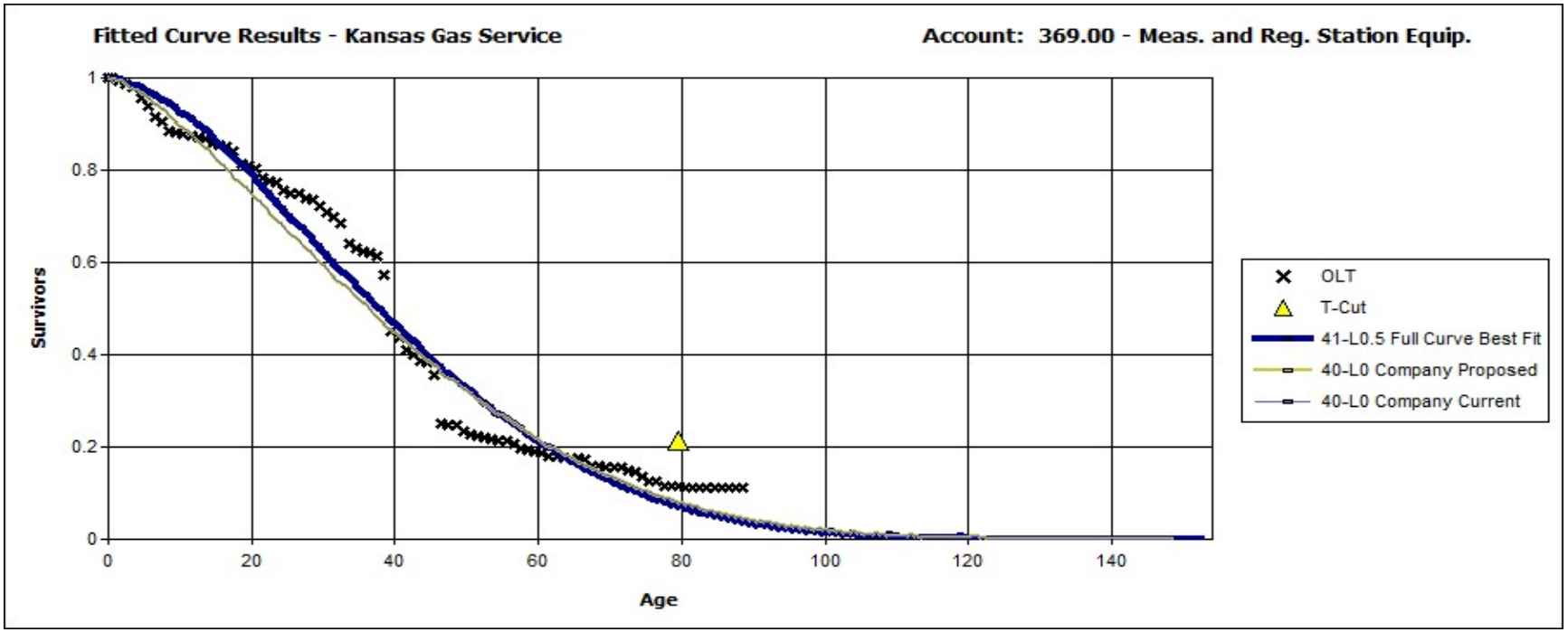
86.5	7,221	0	0.0000	100.0000	0.1133
87.5	2,922	0	0.0000	100.0000	0.1133
88.5	2,398	0	0.0000	100.0000	0.1133

Best Fit Curve Results
Kansas Gas Service
Account: 369.00 - Meas. and Reg. Station Equip.

Curve	Life	Sum of Squared Differences
BAND	**1928 - 2017**	
L0.5	41.0	2,332.444
L1	41.0	2,341.632
L1.5	41.0	2,608.272
L0	41.0	2,988.212
S-0.5	40.0	3,183.324
R0.5	40.0	3,248.445
S0	40.0	3,370.165
O2	42.0	3,506.714
L2	42.0	3,667.258
R1	39.0	3,852.770
S0.5	40.0	3,895.724
O1	40.0	4,272.412
R1.5	40.0	4,655.692
S1	40.0	5,183.954
R2	39.0	6,506.008
S1.5	40.0	6,545.759
L3	41.0	7,341.874
R2.5	40.0	8,333.462
S2	40.0	8,579.342
O3	50.0	8,601.544
R3	40.0	11,093.094
O4	64.0	11,859.358
S3	40.0	12,765.954
L4	41.0	13,776.320
R4	40.0	16,263.820
S4	40.0	18,659.389
L5	40.0	20,134.063
R5	40.0	22,960.522
S5	40.0	24,672.616
S6	40.0	30,461.666
SQ	39.0	43,203.373

Analytical Parameters

OLT Placement Band:	1928 - 2017
OLT Experience Band:	1928 - 2017
Minimum Life Paramet	3
Maximum Life Parame	65
Life Increment Parame	1
Max Age (T-Cut):	79.5



Analytical Parameters

OLT Placement Band:	1928 - 2017
OLT Experience Band:	1928 - 2017
Minimum Life Parameter:	3
Maximum Life Parameter:	65
Life Increment Parameter:	1
Max Age (T-Cut):	81.0

KGS 2017

369.00 -

Calculation of Remaining Life
Based Upon Broad Group/Vintage Group Procedures
Related to Original Cost as of December 31, 2017

Survivor Curve .. IOWA: 40 L0

			BG/VG Average			
		Surviving	Service	Remaining	ASL	RL
Year	Age	Investment	Life	Life	Weights	Weights
(1)	(2)	(3)	(4)	(5)	(6)=(3)/(4)	(7)=(6)*(5)
2017	0.5	859,559	40.00	39.55	21,489	849,957
2016	1.5	636,671	40.00	38.78	15,917	617,230
2015	2.5	2,318,183	40.00	38.08	57,955	2,206,621
2014	3.5	1,159,868	40.00	37.42	28,997	1,085,078
2013	4.5	1,258,158	40.00	36.80	31,454	1,157,656
2012	5.5	398,968	40.00	36.22	9,974	361,270
2011	6.5	489,079	40.00	35.66	12,227	436,049
2010	7.5	438,840	40.00	35.13	10,971	385,397
2009	8.5	234,937	40.00	34.62	5,873	203,308
2008	9.5	669,706	40.00	34.12	16,743	571,255
2007	10.5	801,749	40.00	33.64	20,044	674,291
2006	11.5	632,002	40.00	33.18	15,800	524,201
2005	12.5	619,132	40.00	32.73	15,478	506,559
2004	13.5	407,986	40.00	32.29	10,200	329,338
2003	14.5	430,838	40.00	31.86	10,771	343,190
2002	15.5	962,284	40.00	31.45	24,057	756,504
2001	16.5	145,427	40.00	31.04	3,636	112,847
2000	17.5	356,471	40.00	30.64	8,912	273,057
1999	18.5	1,666,888	40.00	30.25	41,672	1,260,511
1998	19.5	1,846,332	40.00	29.86	46,158	1,378,413
1997	20.5	0	40.00	29.48	0	0
1996	21.5	283,518	40.00	29.11	7,088	206,310
1995	22.5	341,793	40.00	28.74	8,545	245,549
1994	23.5	97,723	40.00	28.37	2,443	69,312
1993	24.5	306,102	40.00	28.01	7,653	214,345
1992	25.5	200,544	40.00	27.65	5,014	138,641
1991	26.5	443,208	40.00	27.30	11,080	302,499
1990	27.5	256,330	40.00	26.95	6,408	172,723
1989	28.5	659,371	40.00	26.61	16,484	438,646
1988	29.5	866,210	40.00	26.27	21,655	568,904

1987	30.5	113,186	40.00	25.94	2,830	73,390
1986	31.5	95,392	40.00	25.61	2,385	61,064
1985	32.5	246,534	40.00	25.28	6,163	155,804
1984	33.5	128,002	40.00	24.96	3,200	79,862
1983	34.5	128,581	40.00	24.64	3,215	79,200
1982	35.5	104,039	40.00	24.32	2,601	63,265
1981	36.5	26,252	40.00	24.01	656	15,760
1980	37.5	48,377	40.00	23.71	1,209	28,670
1979	38.5	29,236	40.00	23.40	731	17,105
1978	39.5	1,092	40.00	23.10	27	630
1977	40.5	17,780	40.00	22.81	445	10,137
1976	41.5	11,834	40.00	22.51	296	6,661
1975	42.5	7,268	40.00	22.22	182	4,038
1974	43.5	4,262	40.00	21.94	107	2,338
1973	44.5	6,071	40.00	21.66	152	3,287
1972	45.5	7,070	40.00	21.38	177	3,779
1971	46.5	7,395	40.00	21.10	185	3,901
1970	47.5	2,703	40.00	20.83	68	1,408
1969	48.5	3,286	40.00	20.56	82	1,689
1968	49.5	4,551	40.00	20.29	114	2,309
1967	50.5	29,431	40.00	20.03	736	14,737
1966	51.5	2,140	40.00	19.77	54	1,058
1965	52.5	3,401	40.00	19.51	85	1,659
1964	53.5	37,508	40.00	19.26	938	18,057
1963	54.5	39,546	40.00	19.00	989	18,789
1962	55.5	28,916	40.00	18.76	723	13,558
1961	56.5	3,501	40.00	18.51	88	1,620
1960	57.5	2,177	40.00	18.26	54	994
1959	58.5	633	40.00	18.02	16	285
1958	59.5	2,690	40.00	17.78	67	1,196
1957	60.5	5,188	40.00	17.55	130	2,276
1956	61.5	9,540	40.00	17.31	239	4,130
1955	62.5	7,407	40.00	17.08	185	3,163
1954	63.5	10,300	40.00	16.85	257	4,340
1953	64.5	8,165	40.00	16.63	204	3,394
1952	65.5	0	40.00	16.40	0	0
1951	66.5	57,115	40.00	16.18	1,428	23,106
1950	67.5	1,033	40.00	15.96	26	412
1949	68.5	0	40.00	15.74	0	0
1948	69.5	0	40.00	15.53	0	0
1947	70.5	338	40.00	15.32	8	129
1946	71.5	1,602	40.00	15.11	40	605
1945	72.5	0	40.00	14.90	0	0
1944	73.5	0	40.00	14.69	0	0
1943	74.5	145	40.00	14.48	4	53
1942	75.5	0	40.00	14.28	0	0
1941	76.5	177	40.00	14.08	4	62

1940	77.5	0	40.00	13.88	0	0
1939	78.5	0	40.00	13.68	0	0
1938	79.5	0	40.00	13.48	0	0
1937	80.5	169	40.00	13.29	4	56
1936	81.5	13	40.00	13.10	0	4
1935	82.5	41	40.00	12.91	1	13
1934	83.5	0	40.00	12.72	0	0
1933	84.5	0	40.00	12.53	0	0
1932	85.5	0	40.00	12.34	0	0
1931	86.5	877	40.00	12.16	22	267
1930	87.5	4,299	40.00	11.97	107	1,287
1929	88.5	524	40.00	11.79	13	154
1928	89.5	2,398	40.00	11.61	60	696
		21,040,060			526,002	17,120,059

AVERAGE SERVICE LIFE	40.00
AVERAGE REMAINING LIFE	32.55

KGS 2017

374.20 -

Calculation of Remaining Life
Based Upon Broad Group/Vintage Group Procedures
Related to Original Cost as of December 31, 2017

Survivor Curve .. IOWA: 70 R1.5

			BG/VG Average			
		Surviving	Service	Remaining	ASL	RL
Year	Age	Investment	Life	Life	Weights	Weights
(1)	(2)	(3)	(4)	(5)	(6)=(3)/(4)	(7)=(6)*(5)
2017	0.5	100,797	70.00	69.59	1,440	100,201
2016	1.5	53,804	70.00	68.76	769	52,854
2015	2.5	8,178	70.00	67.95	117	7,938
2014	3.5	91,587	70.00	67.13	1,308	87,831
2013	4.5	56,379	70.00	66.32	805	53,413
2012	5.5	41,489	70.00	65.51	593	38,827
2011	6.5	111,676	70.00	64.70	1,595	103,226
2010	7.5	31,834	70.00	63.90	455	29,060
2009	8.5	50,515	70.00	63.10	722	45,537
2008	9.5	216,735	70.00	62.31	3,096	192,916
2007	10.5	73,781	70.00	61.51	1,054	64,837
2006	11.5	143,017	70.00	60.73	2,043	124,068
2005	12.5	19,197	70.00	59.94	274	16,438
2004	13.5	102,690	70.00	59.16	1,467	86,784
2003	14.5	2,523	70.00	58.38	36	2,104
2002	15.5	173,352	70.00	57.60	2,476	142,653
2001	16.5	15,170	70.00	56.83	217	12,316
2000	17.5	38,943	70.00	56.06	556	31,190
1999	18.5	679	70.00	55.30	10	537
1998	19.5	215	70.00	54.54	3	167
1997	20.5	10,626	70.00	53.78	152	8,164
1996	21.5	208,010	70.00	53.02	2,972	157,562
1995	22.5	137,371	70.00	52.27	1,962	102,579
1994	23.5	62,094	70.00	51.52	887	45,704
1993	24.5	76,770	70.00	50.78	1,097	55,691
1992	25.5	6,360	70.00	50.04	91	4,546
1991	26.5	63,707	70.00	49.30	910	44,870
1990	27.5	69,667	70.00	48.57	995	48,339
1989	28.5	32,888	70.00	47.84	470	22,477
1988	29.5	72,570	70.00	47.12	1,037	48,846

1987	30.5	4,770	70.00	46.40	68	3,162
1986	31.5	11,849	70.00	45.68	169	7,733
1985	32.5	11,114	70.00	44.97	159	7,140
1984	33.5	3,691	70.00	44.26	53	2,334
1983	34.5	2,251	70.00	43.56	32	1,401
1982	35.5	7,858	70.00	42.86	112	4,812
1981	36.5	3,252	70.00	42.17	46	1,959
1980	37.5	10,210	70.00	41.48	146	6,051
1979	38.5	1,350	70.00	40.80	19	787
1978	39.5	1,934	70.00	40.12	28	1,108
1977	40.5	642	70.00	39.45	9	362
1976	41.5	431	70.00	38.79	6	239
1975	42.5	1,022	70.00	38.12	15	557
1974	43.5	191	70.00	37.47	3	102
1973	44.5	561	70.00	36.82	8	295
1972	45.5	0	70.00	36.18	0	0
1971	46.5	10,047	70.00	35.54	144	5,101
1970	47.5	6,922	70.00	34.91	99	3,452
1969	48.5	1,683	70.00	34.28	24	824
1968	49.5	4,326	70.00	33.66	62	2,080
1967	50.5	1,393	70.00	33.05	20	658
1966	51.5	1,556	70.00	32.45	22	721
1965	52.5	132	70.00	31.85	2	60
1964	53.5	600	70.00	31.26	9	268
1963	54.5	185	70.00	30.67	3	81
1962	55.5	52,560	70.00	30.09	751	22,593
1961	56.5	289	70.00	29.52	4	122
1960	57.5	0	70.00	28.95	0	0
1959	58.5	14	70.00	28.39	0	6
1958	59.5	43	70.00	27.84	1	17
1957	60.5	686	70.00	27.30	10	268
1956	61.5	0	70.00	26.76	0	0
1955	62.5	2,645	70.00	26.23	38	991
1954	63.5	634	70.00	25.71	9	233
1953	64.5	33	70.00	25.20	0	12
1952	65.5	0	70.00	24.69	0	0
1951	66.5	0	70.00	24.19	0	0
1950	67.5	0	70.00	23.70	0	0
1949	68.5	169	70.00	23.22	2	56
1948	69.5	10	70.00	22.74	0	3
1947	70.5	0	70.00	22.27	0	0
1946	71.5	25	70.00	21.81	0	8
1945	72.5	0	70.00	21.35	0	0
1944	73.5	0	70.00	20.90	0	0
1943	74.5	0	70.00	20.47	0	0
1942	75.5	0	70.00	20.03	0	0
1941	76.5	40	70.00	19.61	1	11

1940	77.5	0	70.00	19.19	0	0
1939	78.5	0	70.00	18.78	0	0
1938	79.5	0	70.00	18.38	0	0
1937	80.5	0	70.00	17.98	0	0
1936	81.5	0	70.00	17.59	0	0
1935	82.5	0	70.00	17.21	0	0
1934	83.5	0	70.00	16.83	0	0
1933	84.5	0	70.00	16.46	0	0
1932	85.5	0	70.00	16.10	0	0
1931	86.5	24	70.00	15.74	0	5
1930	87.5	572	70.00	15.39	8	126
		2,218,337			31,691	1,807,414

AVERAGE SERVICE LIFE	70.00
AVERAGE REMAINING LIFE	57.03

Observed Life Table Results
Kansas Gas Service
Account: 375.00 - Structures and Improvements

Age	Exposures	Retiremen	Retiremen Ratio (%)	Survivor Ratio (%)	Cumulative Survivors
BAND		1920 - 2017			
0	1,043,886	0	0.0000	100.0000	1.0000
0.5	957,966	6,165	0.6436	99.3564	1.0000
1.5	953,734	2,891	0.3031	99.6969	0.9936
2.5	944,877	29,085	3.0782	96.9218	0.9906
3.5	915,792	637	0.0696	99.9304	0.9601
4.5	915,957	3,228	0.3524	99.6476	0.9594
5.5	936,382	4,575	0.4886	99.5114	0.9560
6.5	933,293	21,795	2.3353	97.6647	0.9513
7.5	495,921	11,570	2.3331	97.6669	0.9291
8.5	516,592	11,633	2.2519	97.7481	0.9074
9.5	474,219	6,476	1.3657	98.6343	0.8870
10.5	473,339	6,260	1.3226	98.6774	0.8749
11.5	465,828	5,865	1.2591	98.7409	0.8633
12.5	461,003	28,478	6.1774	93.8226	0.8525
13.5	439,289	4,069	0.9262	99.0738	0.7998
14.5	441,102	1,839	0.4170	99.5830	0.7924
15.5	439,313	1,439	0.3276	99.6724	0.7891
16.5	442,677	699	0.1579	99.8421	0.7865
17.5	359,227	970	0.2701	99.7299	0.7853
18.5	161,377	1,897	1.1757	98.8243	0.7831
19.5	161,098	9,834	6.1045	93.8955	0.7739
20.5	160,195	2,053	1.2813	98.7187	0.7267
21.5	159,246	6,408	4.0242	95.9758	0.7174
22.5	154,011	1,799	1.1678	98.8322	0.6885
23.5	152,278	410	0.2693	99.7307	0.6805
24.5	151,868	4,422	2.9118	97.0882	0.6786
25.5	149,448	0	0.0000	100.0000	0.6589
26.5	151,792	52,056	34.2946	65.7054	0.6589
27.5	98,712	28,335	28.7053	71.2947	0.4329
28.5	70,752	1,236	1.7467	98.2533	0.3086
29.5	67,692	2,343	3.4619	96.5381	0.3033
30.5	65,372	0	0.0000	100.0000	0.2928
31.5	48,370	0	0.0000	100.0000	0.2928
32.5	31,500	96	0.3049	99.6951	0.2928
33.5	23,925	0	0.0000	100.0000	0.2919
34.5	21,274	74	0.3464	99.6536	0.2919
35.5	19,578	23	0.1181	99.8819	0.2909
36.5	19,828	47	0.2369	99.7631	0.2905
37.5	23,738	0	0.0000	100.0000	0.2898
38.5	27,828	111	0.3998	99.6002	0.2898

39.5	39,043	0	0.0000	100.0000	0.2887
40.5	56,382	0	0.0000	100.0000	0.2887
41.5	58,154	160	0.2759	99.7241	0.2887
42.5	58,171	458	0.7871	99.2129	0.2879
43.5	60,513	4,090	6.7594	93.2406	0.2856
44.5	59,589	0	0.0000	100.0000	0.2663
45.5	61,621	752	1.2203	98.7797	0.2663
46.5	60,179	12,000	19.9406	80.0594	0.2630
47.5	48,179	390	0.8103	99.1897	0.2106
48.5	48,023	5,706	11.8814	88.1186	0.2089
49.5	42,317	7,627	18.0230	81.9770	0.1841
50.5	32,918	723	2.1958	97.8042	0.1509
51.5	32,119	0	0.0000	100.0000	0.1476
52.5	32,156	0	0.0000	100.0000	0.1476
53.5	32,156	1,298	4.0358	95.9642	0.1476
54.5	29,150	0	0.0000	100.0000	0.1416
55.5	28,958	0	0.0000	100.0000	0.1416
56.5	27,758	0	0.0000	100.0000	0.1416
57.5	27,758	0	0.0000	100.0000	0.1416
58.5	26,918	0	0.0000	100.0000	0.1416
59.5	26,869	2,387	8.8839	91.1161	0.1416
60.5	23,271	0	0.0000	100.0000	0.1290
61.5	23,233	0	0.0000	100.0000	0.1290
62.5	22,622	0	0.0000	100.0000	0.1290
63.5	21,541	0	0.0000	100.0000	0.1290
64.5	20,979	0	0.0000	100.0000	0.1290
65.5	20,966	0	0.0000	100.0000	0.1290
66.5	19,533	0	0.0000	100.0000	0.1290
67.5	13,212	0	0.0000	100.0000	0.1290
68.5	11,645	0	0.0000	100.0000	0.1290
69.5	11,102	1	0.0090	99.9910	0.1290
70.5	10,047	0	0.0000	100.0000	0.1290
71.5	10,047	0	0.0000	100.0000	0.1290
72.5	10,047	0	0.0000	100.0000	0.1290
73.5	10,047	0	0.0000	100.0000	0.1290
74.5	9,956	0	0.0000	100.0000	0.1290
75.5	9,956	0	0.0000	100.0000	0.1290
76.5	9,499	0	0.0000	100.0000	0.1290
77.5	9,124	0	0.0000	100.0000	0.1290
78.5	9,124	0	0.0000	100.0000	0.1290
79.5	9,124	0	0.0000	100.0000	0.1290
80.5	9,027	0	0.0000	100.0000	0.1290
81.5	8,968	0	0.0000	100.0000	0.1290
82.5	8,941	0	0.0000	100.0000	0.1290
83.5	8,156	0	0.0000	100.0000	0.1290
84.5	8,094	0	0.0000	100.0000	0.1290
85.5	7,982	0	0.0000	100.0000	0.1290

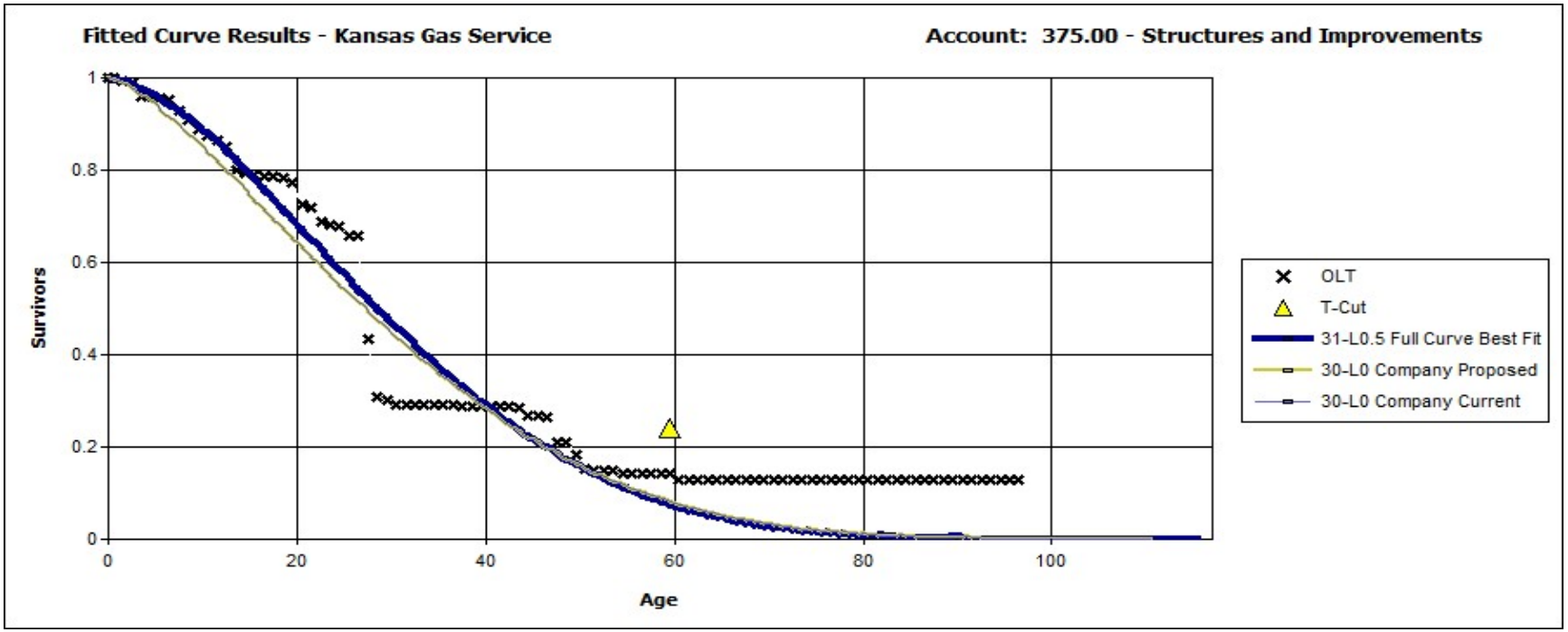
86.5	4,483	0	0.0000	100.0000	0.1290
87.5	4,483	0	0.0000	100.0000	0.1290
88.5	0	0	0.0000	100.0000	0.1290
89.5	0	0	0.0000	100.0000	0.1290
90.5	0	0	0.0000	100.0000	0.1290
91.5	0	0	0.0000	100.0000	0.1290
92.5	0	0	0.0000	100.0000	0.1290
93.5	0	0	0.0000	100.0000	0.1290
94.5	0	0	0.0000	100.0000	0.1290
95.5	0	0	0.0000	100.0000	0.1290
96.5	0	0	0.0000	100.0000	0.1290

Best Fit Curve Results
Kansas Gas Service
Account: 375.00 - Structures and Improvements

Curve	Life	Sum of Squared Differences
BAND	**1920 - 2017**	
L0.5	31.0	2,723.589
L0	31.0	2,952.066
L1	31.0	2,994.618
L1.5	31.0	3,465.524
O2	31.0	3,486.009
S-0.5	30.0	4,046.167
O1	30.0	4,431.606
R0.5	30.0	4,521.934
L2	31.0	4,548.364
S0	30.0	4,617.724
S0.5	30.0	5,464.583
R1	30.0	5,841.712
O3	37.0	6,046.408
S1	30.0	6,883.477
R1.5	30.0	7,155.517
O4	48.0	8,097.500
L3	30.0	8,212.653
S1.5	30.0	8,410.580
R2	29.0	9,158.943
S2	29.0	10,410.284
R2.5	29.0	11,012.722
R3	28.0	13,382.886
S3	29.0	14,114.723
L4	29.0	14,191.149
R4	27.0	17,150.972
S4	28.0	18,397.168
L5	28.0	18,854.004
R5	27.0	21,167.621
S5	27.0	22,131.550
S6	27.0	25,165.174
SQ	27.0	31,922.105

Analytical Parameters

OLT Placement Band:	1920 - 2017
OLT Experience Band:	1920 - 2017
Minimum Life Paramet	1
Maximum Life Parame	100
Life Increment Parame	1
Max Age (T-Cut):	59.5



Analytical Parameters

OLT Placement Band:	1920 - 2017
OLT Experience Band:	1920 - 2017
Minimum Life Parameter:	1
Maximum Life Parameter:	100
Life Increment Parameter:	1
Max Age (T-Cut):	61.0

KGS 2017

375.00 -

Calculation of Remaining Life
Based Upon Broad Group/Vintage Group Procedures
Related to Original Cost as of December 31, 2017

Survivor Curve .. IOWA: 30 L0

			BG/VG Average			
		Surviving	Service	Remaining	ASL	RL
Year	Age	Investment	Life	Life	Weights	Weights
(1)	(2)	(3)	(4)	(5)	(6)=(3)/(4)	(7)=(6)*(5)
2017	0.5	26,240	30.00	29.56	875	25,858
2016	1.5	0	30.00	28.81	0	0
2015	2.5	15,115	30.00	28.15	504	14,181
2014	3.5	0	30.00	27.53	0	0
2013	4.5	0	30.00	26.95	0	0
2012	5.5	0	30.00	26.41	0	0
2011	6.5	0	30.00	25.90	0	0
2010	7.5	421,342	30.00	25.41	14,045	356,867
2009	8.5	11,077	30.00	24.94	369	9,209
2008	9.5	32,262	30.00	24.49	1,075	26,337
2007	10.5	0	30.00	24.06	0	0
2006	11.5	2,698	30.00	23.64	90	2,126
2005	12.5	0	30.00	23.23	0	0
2004	13.5	0	30.00	22.83	0	0
2003	14.5	0	30.00	22.45	0	0
2002	15.5	3,864	30.00	22.07	129	2,842
2001	16.5	111	30.00	21.69	4	80
2000	17.5	84,919	30.00	21.32	2,831	60,362
1999	18.5	203,888	30.00	20.96	6,796	142,473
1998	19.5	0	30.00	20.61	0	0
1997	20.5	0	30.00	20.26	0	0
1996	21.5	0	30.00	19.92	0	0
1995	22.5	0	30.00	19.58	0	0
1994	23.5	0	30.00	19.25	0	0
1993	24.5	0	30.00	18.92	0	0
1992	25.5	0	30.00	18.60	0	0
1991	26.5	0	30.00	18.28	0	0
1990	27.5	1,525	30.00	17.97	51	914
1989	28.5	0	30.00	17.67	0	0
1988	29.5	8,250	30.00	17.37	275	4,776

1987	30.5	0	30.00	17.07	0	0
1986	31.5	17,145	30.00	16.78	572	9,589
1985	32.5	16,929	30.00	16.49	564	9,306
1984	33.5	7,617	30.00	16.21	254	4,116
1983	34.5	3,436	30.00	15.93	115	1,825
1982	35.5	1,684	30.00	15.66	56	879
1981	36.5	0	30.00	15.39	0	0
1980	37.5	0	30.00	15.12	0	0
1979	38.5	0	30.00	14.86	0	0
1978	39.5	0	30.00	14.60	0	0
1977	40.5	0	30.00	14.35	0	0
1976	41.5	0	30.00	14.10	0	0
1975	42.5	0	30.00	13.85	0	0
1974	43.5	0	30.00	13.61	0	0
1973	44.5	0	30.00	13.37	0	0
1972	45.5	0	30.00	13.13	0	0
1971	46.5	690	30.00	12.90	23	297
1970	47.5	0	30.00	12.67	0	0
1969	48.5	988	30.00	12.45	33	410
1968	49.5	0	30.00	12.22	0	0
1967	50.5	1,772	30.00	12.00	59	709
1966	51.5	77	30.00	11.78	3	30
1965	52.5	0	30.00	11.57	0	0
1964	53.5	0	30.00	11.36	0	0
1963	54.5	1,708	30.00	11.15	57	635
1962	55.5	192	30.00	10.94	6	70
1961	56.5	1,200	30.00	10.74	40	429
1960	57.5	0	30.00	10.54	0	0
1959	58.5	840	30.00	10.34	28	290
1958	59.5	48	30.00	10.14	2	16
1957	60.5	1,212	30.00	9.95	40	402
1956	61.5	37	30.00	9.75	1	12
1955	62.5	612	30.00	9.56	20	195
1954	63.5	1,080	30.00	9.38	36	338
1953	64.5	562	30.00	9.19	19	172
1952	65.5	14	30.00	9.01	0	4
1951	66.5	1,432	30.00	8.82	48	421
1950	67.5	6,321	30.00	8.64	211	1,822
1949	68.5	1,567	30.00	8.47	52	442
1948	69.5	543	30.00	8.29	18	150
1947	70.5	1,055	30.00	8.12	35	285
1946	71.5	0	30.00	7.94	0	0
1945	72.5	0	30.00	7.77	0	0
1944	73.5	0	30.00	7.60	0	0
1943	74.5	90	30.00	7.43	3	22
1942	75.5	0	30.00	7.27	0	0
1941	76.5	457	30.00	7.10	15	108

1940	77.5	376	30.00	6.93	13	87
1939	78.5	0	30.00	6.77	0	0
1938	79.5	0	30.00	6.61	0	0
1937	80.5	96	30.00	6.44	3	21
1936	81.5	60	30.00	6.28	2	12
1935	82.5	26	30.00	6.12	1	5
1934	83.5	786	30.00	5.96	26	156
1933	84.5	61	30.00	5.80	2	12
1932	85.5	113	30.00	5.64	4	21
1931	86.5	3,498	30.00	5.48	117	639
1930	87.5	0	30.00	5.32	0	0
1929	88.5	4,483	30.00	5.16	149	772
1928	89.5	0	30.00	5.00	0	0
1927	90.5	0	30.00	4.84	0	0
1926	91.5	0	30.00	4.68	0	0
1925	92.5	0	30.00	4.52	0	0
1924	93.5	0	30.00	4.35	0	0
1923	94.5	0	30.00	4.19	0	0
1922	95.5	0	30.00	4.02	0	0
1921	96.5	0	30.00	3.85	0	0
1920	97.5	0	30.00	3.67	0	0
		890,099			29,670	680,724

AVERAGE SERVICE LIFE	30.00
AVERAGE REMAINING LIFE	22.94

Observed Life Table Results
Kansas Gas Service
Account: 376.10 - Mains - Metallic

Age	Exposures	Retirements	Retirement Ratio (%)	Survivor Ratio (%)	Cumulative Survivors
BAND		1902 - 2017			
0	101,475,999	167,001	0.1646	99.8354	1.0000
0.5	154,908,677	301,104	0.1944	99.8056	0.9984
1.5	159,510,488	334,149	0.2095	99.7905	0.9964
2.5	157,120,050	443,780	0.2824	99.7176	0.9943
3.5	156,440,765	259,592	0.1659	99.8341	0.9915
4.5	159,644,635	509,693	0.3193	99.6807	0.9899
5.5	162,829,822	501,049	0.3077	99.6923	0.9867
6.5	170,211,448	458,256	0.2692	99.7308	0.9837
7.5	169,341,290	612,750	0.3618	99.6382	0.9810
8.5	169,428,637	682,647	0.4029	99.5971	0.9775
9.5	166,435,211	486,243	0.2922	99.7078	0.9735
10.5	165,292,752	392,056	0.2372	99.7628	0.9707
11.5	158,657,902	562,041	0.3542	99.6458	0.9684
12.5	154,168,551	2,523,770	1.6370	98.3630	0.9650
13.5	146,930,357	1,402,139	0.9543	99.0457	0.9492
14.5	140,038,754	4,039,998	2.8849	97.1151	0.9401
15.5	124,718,449	7,153,949	5.7361	94.2639	0.9130
16.5	113,167,572	1,436,373	1.2692	98.7308	0.8606
17.5	100,484,955	1,686,722	1.6786	98.3214	0.8497
18.5	96,851,530	600,245	0.6198	99.3802	0.8354
19.5	98,010,387	342,369	0.3493	99.6507	0.8303
20.5	95,107,458	315,241	0.3315	99.6685	0.8274
21.5	88,464,808	218,365	0.2468	99.7532	0.8246
22.5	81,620,261	220,563	0.2702	99.7298	0.8226
23.5	74,593,130	108,257	0.1451	99.8549	0.8204
24.5	67,275,973	124,664	0.1853	99.8147	0.8192
25.5	65,349,831	585,871	0.8965	99.1035	0.8176
26.5	59,496,649	155,794	0.2619	99.7381	0.8103
27.5	55,710,404	106,208	0.1906	99.8094	0.8082
28.5	54,332,513	105,915	0.1949	99.8051	0.8067
29.5	53,325,130	225,118	0.4222	99.5778	0.8051
30.5	49,560,437	110,878	0.2237	99.7763	0.8017
31.5	47,910,359	180,361	0.3765	99.6235	0.7999
32.5	45,188,647	170,625	0.3776	99.6224	0.7969
33.5	45,349,345	141,164	0.3113	99.6887	0.7939
34.5	44,597,575	68,088	0.1527	99.8473	0.7914
35.5	43,491,300	111,137	0.2555	99.7445	0.7902
36.5	43,453,643	145,888	0.3357	99.6643	0.7882
37.5	40,519,351	96,226	0.2375	99.7625	0.7855
38.5	40,302,910	133,457	0.3311	99.6689	0.7837

39.5	38,949,393	111,510	0.2863	99.7137	0.7811
40.5	38,815,049	94,217	0.2427	99.7573	0.7788
41.5	37,191,384	128,782	0.3463	99.6537	0.7769
42.5	36,330,904	116,727	0.3213	99.6787	0.7742
43.5	35,834,528	88,213	0.2462	99.7538	0.7718
44.5	35,283,637	179,025	0.5074	99.4926	0.7699
45.5	35,825,919	163,514	0.4564	99.5436	0.7660
46.5	33,667,880	284,050	0.8437	99.1563	0.7625
47.5	32,736,588	411,352	1.2565	98.7435	0.7560
48.5	31,109,008	193,794	0.6230	99.3770	0.7465
49.5	29,308,740	483,883	1.6510	98.3490	0.7419
50.5	28,054,324	195,827	0.6980	99.3020	0.7296
51.5	25,813,562	227,807	0.8825	99.1175	0.7245
52.5	24,791,654	237,252	0.9570	99.0430	0.7181
53.5	23,400,032	197,629	0.8446	99.1554	0.7113
54.5	20,922,184	280,318	1.3398	98.6602	0.7053
55.5	19,851,585	275,378	1.3872	98.6128	0.6958
56.5	17,457,971	179,119	1.0260	98.9740	0.6862
57.5	16,031,267	152,890	0.9537	99.0463	0.6791
58.5	14,436,330	93,262	0.6460	99.3540	0.6726
59.5	14,011,746	76,247	0.5442	99.4558	0.6683
60.5	13,544,277	122,106	0.9015	99.0985	0.6647
61.5	12,359,725	59,196	0.4789	99.5211	0.6587
62.5	11,254,563	35,451	0.3150	99.6850	0.6555
63.5	9,231,842	94,179	1.0202	98.9798	0.6534
64.5	7,922,693	44,422	0.5607	99.4393	0.6468
65.5	6,488,275	40,858	0.6297	99.3703	0.6432
66.5	5,199,127	29,014	0.5581	99.4419	0.6391
67.5	4,485,554	35,819	0.7985	99.2015	0.6355
68.5	4,212,257	20,642	0.4901	99.5099	0.6305
69.5	4,630,023	14,450	0.3121	99.6879	0.6274
70.5	4,271,247	21,305	0.4988	99.5012	0.6254
71.5	4,529,748	17,919	0.3956	99.6044	0.6223
72.5	5,007,586	26,610	0.5314	99.4686	0.6198
73.5	5,485,147	54,663	0.9966	99.0034	0.6165
74.5	6,476,171	114,998	1.7757	98.2243	0.6104
75.5	6,707,736	174,432	2.6005	97.3995	0.5996
76.5	6,526,947	115,900	1.7757	98.2243	0.5840
77.5	6,285,471	118,202	1.8806	98.1194	0.5736
78.5	6,091,938	341,688	5.6089	94.3911	0.5628
79.5	8,360,765	214,029	2.5599	97.4401	0.5312
80.5	7,997,106	150,019	1.8759	98.1241	0.5176
81.5	7,605,324	240,685	3.1647	96.8353	0.5079
82.5	7,153,402	390,374	5.4572	94.5428	0.4919
83.5	6,736,177	234,491	3.4811	96.5189	0.4650
84.5	6,470,668	255,887	3.9546	96.0454	0.4488
85.5	6,106,682	159,824	2.6172	97.3828	0.4311

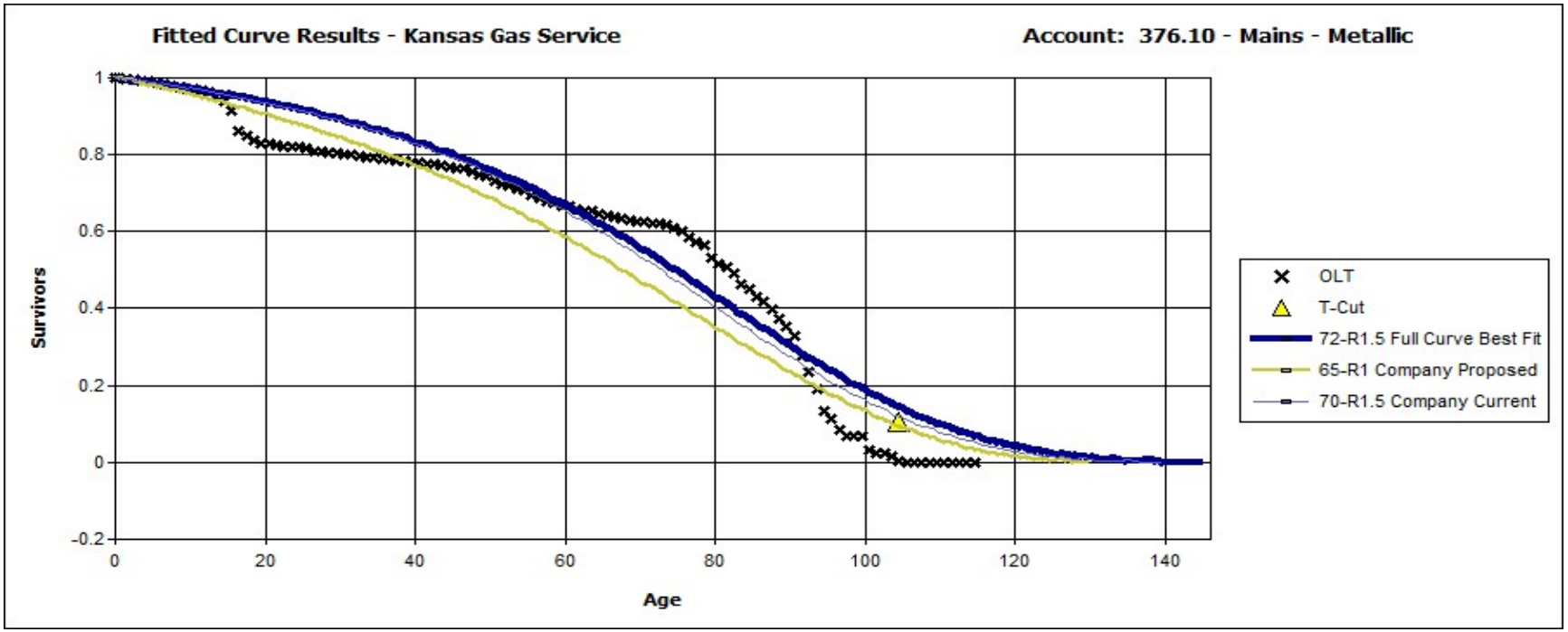
86.5	5,510,891	274,674	4.9842	95.0158	0.4198
87.5	4,752,736	313,452	6.5952	93.4048	0.3989
88.5	4,248,279	209,934	4.9416	95.0584	0.3726
89.5	3,820,988	268,248	7.0204	92.9796	0.3542
90.5	2,904,491	486,676	16.7560	83.2440	0.3293
91.5	2,059,153	284,111	13.7975	86.2025	0.2741
92.5	1,273,778	248,795	19.5321	80.4679	0.2363
93.5	912,499	267,873	29.3559	70.6441	0.1901
94.5	636,425	92,456	14.5274	85.4726	0.1343
95.5	542,535	135,183	24.9169	75.0831	0.1148
96.5	407,020	80,515	19.7817	80.2183	0.0862
97.5	150,527	0	0.0000	100.0000	0.0692
98.5	150,527	0	0.0000	100.0000	0.0692
99.5	150,527	76,946	51.1180	48.8820	0.0692
100.5	73,581	22,793	30.9767	69.0233	0.0338
101.5	50,788	2,651	5.2191	94.7809	0.0233
102.5	48,137	15,658	32.5279	67.4721	0.0221
103.5	32,479	24,320	74.8795	25.1205	0.0149
104.5	8,159	8,159	100.0000	0.0000	0.0037
105.5	0	0	0.0000	100.0000	0.0000
106.5	0	0	0.0000	100.0000	0.0000
107.5	0	0	0.0000	100.0000	0.0000
108.5	0	0	0.0000	100.0000	0.0000
109.5	0	0	0.0000	100.0000	0.0000
110.5	0	0	0.0000	100.0000	0.0000
111.5	0	0	0.0000	100.0000	0.0000
112.5	0	0	0.0000	100.0000	0.0000
113.5	0	0	0.0000	100.0000	0.0000
114.5	0	0	0.0000	100.0000	0.0000

Best Fit Curve Results
Kansas Gas Service
Account: 376.10 - Mains - Metallic

Curve	Life	Sum of Squared Differences
BAND	**1902 - 2017**	
R1.5	72.0	5,912.404
R1	71.0	6,083.358
R2	73.0	7,015.075
R0.5	70.0	7,962.029
S0.5	73.0	8,217.853
S0	72.0	8,267.778
R2.5	74.0	9,065.451
S1	73.0	9,088.846
S-0.5	71.0	9,171.151
S1.5	74.0	10,340.306
L1	76.0	10,493.152
L0.5	77.0	10,718.499
L1.5	76.0	10,769.818
O1	71.0	11,540.624
L0	78.0	11,795.250
O2	80.0	12,225.028
L2	77.0	12,239.782
R3	75.0	12,245.882
S2	75.0	12,482.933
L3	77.0	16,093.871
S3	76.0	17,656.083
O3	100.0	17,808.320
R4	77.0	19,944.444
L4	78.0	22,023.990
S4	78.0	26,256.597
L5	79.0	30,524.924
O4	100.0	30,547.430
R5	80.0	32,175.167
S5	80.0	36,331.578
S6	82.0	46,968.507
SQ	82.0	72,878.478

Analytical Parameters

OLT Placement Band:	1902 - 2017
OLT Experience Band:	1902 - 2017
Minimum Life Parameter	1
Maximum Life Paramete	100
Life Increment Paramete	1
Max Age (T-Cut):	104.5



Analytical Parameters

OLT Placement Band:	1902 - 2017
OLT Experience Band:	1902 - 2017
Minimum Life Parameter:	1
Maximum Life Parameter:	100
Life Increment Parameter:	1
Max Age (T-Cut):	106.0

KGS 2017

376.10 -

Calculation of Remaining Life
Based Upon Broad Group/Vintage Group Procedures
Related to Original Cost as of December 31, 2017

Survivor Curve .. IOWA: 72 R1.5

			BG/VG Average			
Year	Age	Surviving Investment	Service Life	Remaining Life	ASL Weights	RL Weights
(1)	(2)	(3)	(4)	(5)	(6)=(3)/(4)	(7)=(6)*(5)
2017	0.5	3,629,302	72.00	71.59	50,407	3,608,442
2016	1.5	4,742,939	72.00	70.76	65,874	4,661,513
2015	2.5	4,001,555	72.00	69.95	55,577	3,887,357
2014	3.5	5,321,268	72.00	69.13	73,906	5,109,111
2013	4.5	4,176,855	72.00	68.32	58,012	3,963,195
2012	5.5	8,259,627	72.00	67.51	114,717	7,744,277
2011	6.5	4,713,141	72.00	66.70	65,460	4,366,285
2010	7.5	4,521,477	72.00	65.90	62,798	4,138,325
2009	8.5	7,087,600	72.00	65.10	98,439	6,408,267
2008	9.5	7,488,078	72.00	64.30	104,001	6,687,529
2007	10.5	4,756,568	72.00	63.51	66,063	4,195,652
2006	11.5	7,961,919	72.00	62.72	110,582	6,935,634
2005	12.5	7,207,378	72.00	61.93	100,102	6,199,632
2004	13.5	7,146,745	72.00	61.15	99,260	6,069,710
2003	14.5	7,511,638	72.00	60.37	104,328	6,298,220
2002	15.5	13,584,367	72.00	59.59	188,672	11,243,434
2001	16.5	8,166,721	72.00	58.82	113,427	6,671,623
2000	17.5	16,646,588	72.00	58.05	231,203	13,421,027
1999	18.5	8,461,538	72.00	57.28	117,521	6,731,846
1998	19.5	987,716	72.00	56.52	13,718	775,331
1997	20.5	2,192,059	72.00	55.76	30,445	1,697,570
1996	21.5	5,521,432	72.00	55.00	76,687	4,217,835
1995	22.5	8,783,999	72.00	54.25	122,000	6,618,205
1994	23.5	9,642,880	72.00	53.50	133,929	7,164,867
1993	24.5	9,016,462	72.00	52.75	125,229	6,605,891
1992	25.5	3,855,634	72.00	52.01	53,550	2,785,052
1991	26.5	7,612,425	72.00	51.27	105,728	5,420,522
1990	27.5	5,358,159	72.00	50.53	74,419	3,760,600
1989	28.5	5,086,057	72.00	49.80	70,640	3,517,946
1988	29.5	3,201,148	72.00	49.07	44,460	2,181,808

1987	30.5	6,222,747	72.00	48.35	86,427	4,178,714
1986	31.5	4,208,680	72.00	47.63	58,454	2,784,152
1985	32.5	4,222,266	72.00	46.91	58,643	2,751,178
1984	33.5	2,352,034	72.00	46.20	32,667	1,509,335
1983	34.5	2,460,679	72.00	45.50	34,176	1,554,894
1982	35.5	2,533,310	72.00	44.79	35,185	1,576,095
1981	36.5	2,725,208	72.00	44.10	37,850	1,669,087
1980	37.5	3,723,879	72.00	43.40	51,721	2,244,899
1979	38.5	2,730,538	72.00	42.72	37,924	1,620,005
1978	39.5	3,107,890	72.00	42.03	43,165	1,814,401
1977	40.5	1,948,258	72.00	41.36	27,059	1,119,069
1976	41.5	2,610,128	72.00	40.68	36,252	1,474,869
1975	42.5	1,640,346	72.00	40.02	22,783	911,678
1974	43.5	1,948,460	72.00	39.36	27,062	1,065,026
1973	44.5	2,066,539	72.00	38.70	28,702	1,110,727
1972	45.5	1,711,106	72.00	38.05	23,765	904,224
1971	46.5	3,710,122	72.00	37.40	51,529	1,927,369
1970	47.5	2,227,297	72.00	36.76	30,935	1,137,271
1969	48.5	2,595,975	72.00	36.13	36,055	1,302,704
1968	49.5	2,540,281	72.00	35.50	35,282	1,252,622
1967	50.5	1,623,614	72.00	34.88	22,550	786,599
1966	51.5	2,557,449	72.00	34.27	35,520	1,217,184
1965	52.5	1,754,006	72.00	33.66	24,361	819,958
1964	53.5	1,421,275	72.00	33.06	19,740	652,529
1963	54.5	2,719,928	72.00	32.46	37,777	1,226,248
1962	55.5	812,069	72.00	31.87	11,279	359,461
1961	56.5	2,261,946	72.00	31.29	31,416	982,948
1960	57.5	1,651,812	72.00	30.71	22,942	704,584
1959	58.5	1,591,622	72.00	30.14	22,106	666,326
1958	59.5	516,277	72.00	29.58	7,171	212,104
1957	60.5	518,078	72.00	29.02	7,196	208,842
1956	61.5	1,183,119	72.00	28.48	16,432	467,917
1955	62.5	1,330,857	72.00	27.93	18,484	516,329
1954	63.5	2,241,005	72.00	27.40	31,125	852,796
1953	64.5	1,443,154	72.00	26.87	20,044	538,610
1952	65.5	1,423,509	72.00	26.35	19,771	520,981
1951	66.5	1,282,332	72.00	25.84	17,810	460,179
1950	67.5	796,838	72.00	25.33	11,067	280,354
1949	68.5	758,365	72.00	24.83	10,533	261,564
1948	69.5	358,659	72.00	24.34	4,981	121,257
1947	70.5	892,934	72.00	23.86	12,402	295,878
1946	71.5	95,492	72.00	23.38	1,326	31,010
1945	72.5	352,144	72.00	22.91	4,891	112,057
1944	73.5	18,955	72.00	22.45	263	5,910
1943	74.5	129,801	72.00	21.99	1,803	39,651
1942	75.5	369,820	72.00	21.55	5,136	110,671
1941	76.5	217,224	72.00	21.11	3,017	63,677

1940	77.5	146,741	72.00	20.67	2,038	42,133
1939	78.5	111,793	72.00	20.25	1,553	31,436
1938	79.5	110,129	72.00	19.83	1,530	30,327
1937	80.5	248,787	72.00	19.42	3,455	67,087
1936	81.5	241,763	72.00	19.01	3,358	63,832
1935	82.5	211,237	72.00	18.61	2,934	54,603
1934	83.5	26,851	72.00	18.22	373	6,795
1933	84.5	31,815	72.00	17.83	442	7,881
1932	85.5	108,099	72.00	17.46	1,501	26,207
1931	86.5	435,967	72.00	17.08	6,055	103,437
1930	87.5	483,481	72.00	16.72	6,715	112,247
1929	88.5	191,006	72.00	16.36	2,653	43,388
1928	89.5	217,357	72.00	16.00	3,019	48,302
1927	90.5	648,248	72.00	15.65	9,003	140,909
1926	91.5	358,663	72.00	15.31	4,981	76,249
1925	92.5	501,263	72.00	14.97	6,962	104,202
1924	93.5	112,484	72.00	14.63	1,562	22,862
1923	94.5	8,211	72.00	14.30	114	1,631
1922	95.5	1,433	72.00	13.98	20	278
1921	96.5	333	72.00	13.66	5	63
1920	97.5	326,328	72.00	13.34	4,532	60,468
1919	98.5	0	72.00	13.03	0	0
1918	99.5	0	72.00	12.72	0	0
1917	100.5	0	72.00	12.41	0	0
1916	101.5	0	72.00	12.11	0	0
1915	102.5	0	72.00	11.81	0	0
1914	103.5	0	72.00	11.52	0	0
1913	104.5	0	72.00	11.22	0	0
1912	105.5	0	72.00	10.93	0	0
1911	106.5	0	72.00	10.65	0	0
1910	107.5	0	72.00	10.36	0	0
1909	108.5	0	72.00	10.08	0	0
1908	109.5	0	72.00	9.80	0	0
1907	110.5	0	72.00	9.53	0	0
1906	111.5	0	72.00	9.26	0	0
1905	112.5	0	72.00	8.99	0	0
1904	113.5	0	72.00	8.72	0	0
1903	114.5	0	72.00	8.46	0	0
1902	115.5	0	72.00	8.20	0	0
		288,773,291			4,010,740	210,554,986

AVERAGE SERVICE LIFE	72.00
AVERAGE REMAINING LIFE	52.50

Observed Life Table Results
Kansas Gas Service
Account: 376.20 - Mains - Plastic

Age	Exposures	Retirements	Retirement Ratio (%)	Survivor Ratio (%)	Cumulative Survivors
BAND		1945 - 2017			
0	234,874,007	14,616	0.0062	99.9938	1.0000
0.5	219,897,860	31,657	0.0144	99.9856	0.9999
1.5	202,137,511	164,708	0.0815	99.9185	0.9998
2.5	193,403,286	188,456	0.0974	99.9026	0.9990
3.5	194,466,898	158,578	0.0815	99.9185	0.9980
4.5	198,417,930	145,169	0.0732	99.9268	0.9972
5.5	200,934,554	143,700	0.0715	99.9285	0.9965
6.5	204,286,769	200,521	0.0982	99.9018	0.9957
7.5	201,142,759	325,979	0.1621	99.8379	0.9948
8.5	200,400,483	267,782	0.1336	99.8664	0.9932
9.5	193,995,972	179,792	0.0927	99.9073	0.9918
10.5	186,045,252	160,396	0.0862	99.9138	0.9909
11.5	179,577,385	189,380	0.1055	99.8945	0.9901
12.5	173,229,180	171,219	0.0988	99.9012	0.9890
13.5	167,022,024	292,885	0.1754	99.8246	0.9880
14.5	160,031,450	272,610	0.1703	99.8297	0.9863
15.5	143,449,847	205,159	0.1430	99.8570	0.9846
16.5	133,387,572	229,638	0.1722	99.8278	0.9832
17.5	107,356,255	166,251	0.1549	99.8451	0.9815
18.5	91,923,535	120,784	0.1314	99.8686	0.9800
19.5	93,258,566	239,683	0.2570	99.7430	0.9787
20.5	93,568,638	166,126	0.1775	99.8225	0.9762
21.5	88,745,943	107,454	0.1211	99.8789	0.9745
22.5	78,488,561	129,809	0.1654	99.8346	0.9733
23.5	66,631,344	467,803	0.7021	99.2979	0.9717
24.5	56,806,399	289,302	0.5093	99.4907	0.9649
25.5	52,606,382	166,591	0.3167	99.6833	0.9599
26.5	46,530,992	151,412	0.3254	99.6746	0.9569
27.5	41,309,955	184,045	0.4455	99.5545	0.9538
28.5	37,137,939	213,330	0.5744	99.4256	0.9495
29.5	33,599,011	52,987	0.1577	99.8423	0.9441
30.5	29,088,056	99,983	0.3437	99.6563	0.9426
31.5	25,442,233	69,770	0.2742	99.7258	0.9394
32.5	21,593,550	103,793	0.4807	99.5193	0.9368
33.5	18,746,955	77,771	0.4148	99.5852	0.9323
34.5	17,094,820	51,753	0.3027	99.6973	0.9284
35.5	15,203,663	162,401	1.0682	98.9318	0.9256
36.5	12,706,696	61,331	0.4827	99.5173	0.9157
37.5	9,930,859	194,427	1.9578	98.0422	0.9113
38.5	7,252,363	45,561	0.6282	99.3718	0.8935

39.5	4,903,771	89,467	1.8244	98.1756	0.8878
40.5	3,540,500	114,403	3.2313	96.7687	0.8716
41.5	2,159,290	73,115	3.3861	96.6139	0.8435
42.5	953,144	71,958	7.5496	92.4504	0.8149
43.5	137,191	67,597	49.2717	50.7283	0.7534
44.5	33,054	5,376	16.2657	83.7343	0.3822
45.5	25,863	0	0.0000	100.0000	0.3200
46.5	18,249	0	0.0000	100.0000	0.3200
47.5	16,647	2	0.0120	99.9880	0.3200
48.5	16,645	0	0.0000	100.0000	0.3200
49.5	16,467	4,213	25.5865	74.4135	0.3200
50.5	11,911	0	0.0000	100.0000	0.2381
51.5	11,593	170	1.4675	98.5325	0.2381
52.5	11,256	40	0.3540	99.6460	0.2346
53.5	9,239	43	0.4620	99.5380	0.2338
54.5	9,027	63	0.6991	99.3009	0.2327
55.5	8,060	-2	-0.0236	100.0236	0.2311
56.5	7,830	106	1.3568	98.6432	0.2311
57.5	4,230	72	1.7088	98.2912	0.2280
58.5	3,468	67	1.9201	98.0799	0.2241
59.5	3,269	0	0.0000	100.0000	0.2198
60.5	3,038	0	0.0000	100.0000	0.2198
61.5	3,038	0	0.0000	100.0000	0.2198
62.5	3,038	809	26.6423	73.3577	0.2198
63.5	2,228	1,762	79.0857	20.9143	0.1612
64.5	2,395	0	0.0000	100.0000	0.0337
65.5	2,395	0	0.0000	100.0000	0.0337
66.5	2,395	0	0.0000	100.0000	0.0337
67.5	2,395	0	0.0000	100.0000	0.0337
68.5	2,395	0	0.0000	100.0000	0.0337
69.5	12	0	0.0000	100.0000	0.0337
70.5	12	0	0.0000	100.0000	0.0337
71.5	12	0	0.0000	100.0000	0.0337

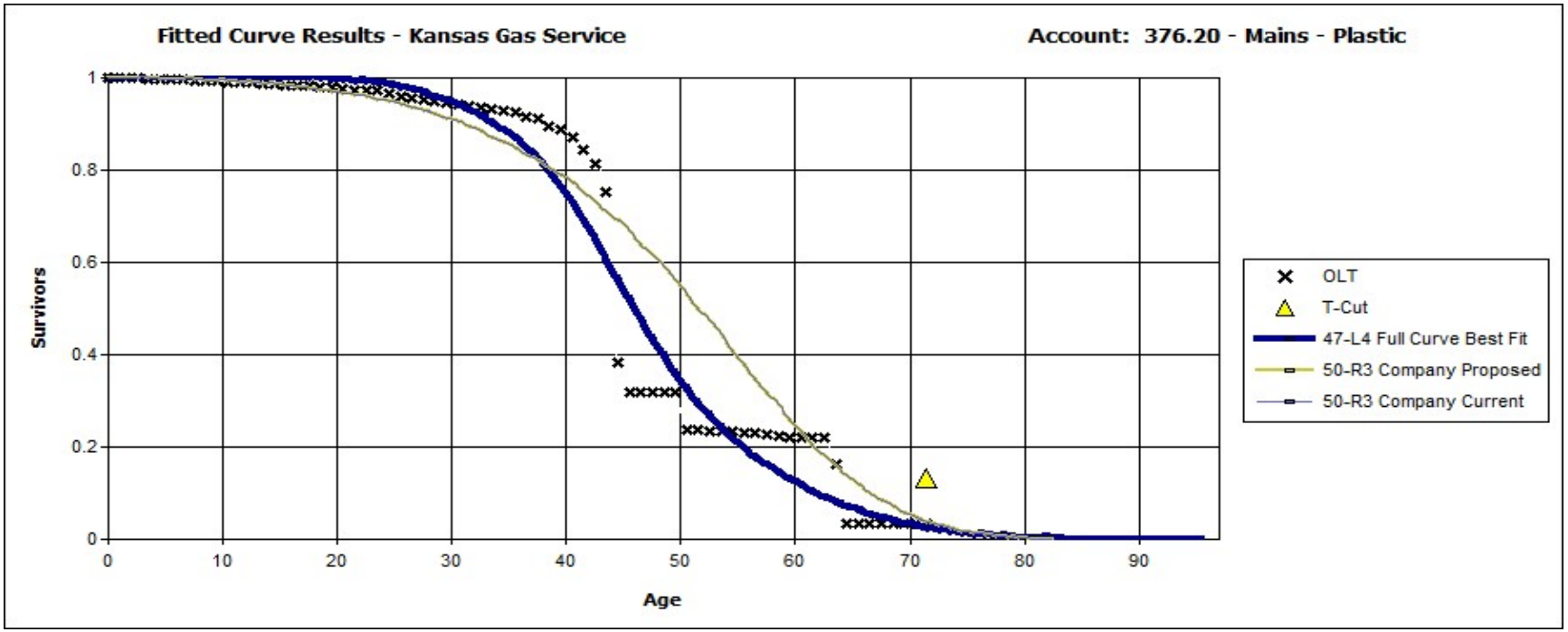
Best Fit Curve Results
Kansas Gas Service
Account: 376.20 - Mains - Plastic

Curve	Life	Sum of Squared Differences
BAND	**1945 - 2017**	
L4	47.0	3,416.560
L5	47.0	4,260.270
S3	47.0	4,827.357
S4	47.0	4,845.198
R4	46.0	5,641.265
R3	46.0	5,996.323
L3	48.0	6,320.273
S5	46.0	6,471.133
R5	46.0	6,647.438
S2	47.0	6,975.737
R2.5	46.0	7,259.749
S6	45.0	8,783.299
S1.5	46.0	8,892.325
R2	45.0	9,448.341
S1	46.0	11,464.537
L2	49.0	12,148.756
R1.5	45.0	12,509.943
S0.5	46.0	14,519.335
L1.5	49.0	15,598.171
SQ	44.0	15,916.119
R1	44.0	16,575.496
S0	45.0	18,296.517
L1	49.0	19,865.481
R0.5	44.0	22,325.853
S-0.5	45.0	23,339.911
L0.5	49.0	23,463.564
L0	50.0	27,650.003
O1	44.0	29,467.095
O2	51.0	30,515.520
O3	69.0	38,735.505
O4	93.0	41,867.913

Analytical Parameters

OLT Placement Band:	1945 - 2017
OLT Experience Band:	1945 - 2017
Minimum Life Parameter	1
Maximum Life Parameter	100
Life Increment Parameter	1

Max Age (T-Cut):	71.5



Analytical Parameters

OLT Placement Band:	1945 - 2017
OLT Experience Band:	1945 - 2017
Minimum Life Parameter:	1
Maximum Life Parameter:	100
Life Increment Parameter:	1
Max Age (T-Cut):	73.0

KGS 2017

376.20 -

Calculation of Remaining Life
Based Upon Broad Group/Vintage Group Procedures
Related to Original Cost as of December 31, 2017

Survivor Curve .. IOWA: 47 L4

			BG/VG Average			
Year	Age	Surviving Investment	Service Life	Remaining Life	ASL Weights	RL Weights
(1)	(2)	(3)	(4)	(5)	(6)=(3)/(4)	(7)=(6)*(5)
2017	0.5	15,277,790	47.00	46.50	325,059	15,114,364
2016	1.5	13,378,618	47.00	45.50	284,651	12,950,857
2015	2.5	13,742,527	47.00	44.50	292,394	13,010,735
2014	3.5	10,208,434	47.00	43.50	217,201	9,447,633
2013	4.5	7,487,880	47.00	42.50	159,317	6,770,516
2012	5.5	10,216,412	47.00	41.50	217,370	9,020,276
2011	6.5	7,591,341	47.00	40.50	161,518	6,541,029
2010	7.5	8,107,747	47.00	39.50	172,505	6,813,482
2009	8.5	7,424,102	47.00	38.50	157,960	6,081,010
2008	9.5	10,834,054	47.00	37.50	230,512	8,643,557
2007	10.5	11,562,116	47.00	36.50	246,002	8,978,412
2006	11.5	9,696,961	47.00	35.50	206,318	7,323,735
2005	12.5	11,452,278	47.00	34.50	243,665	8,405,826
2004	13.5	10,057,427	47.00	33.50	213,988	7,168,178
2003	14.5	11,056,089	47.00	32.50	235,236	7,645,160
2002	15.5	19,457,101	47.00	31.50	413,981	13,042,091
2001	16.5	10,297,385	47.00	30.51	219,093	6,684,944
2000	17.5	24,779,228	47.00	29.52	527,218	15,565,921
1999	18.5	13,973,521	47.00	28.54	297,309	8,486,402
1998	19.5	2,524,068	47.00	27.57	53,704	1,480,697
1997	20.5	5,703,608	47.00	26.61	121,353	3,229,098
1996	21.5	11,296,299	47.00	25.66	240,347	6,166,733
1995	22.5	11,576,218	47.00	24.72	246,303	6,088,302
1994	23.5	13,143,162	47.00	23.79	279,642	6,653,683
1993	24.5	10,780,482	47.00	22.88	229,372	5,248,827
1992	25.5	5,084,446	47.00	21.99	108,180	2,378,725
1991	26.5	6,564,312	47.00	21.11	139,666	2,948,289
1990	27.5	5,267,687	47.00	20.25	112,078	2,269,184
1989	28.5	4,028,907	47.00	19.40	85,721	1,662,938
1988	29.5	3,328,344	47.00	18.57	70,816	1,314,942

1987	30.5	4,459,412	47.00	17.75	94,881	1,684,535
1986	31.5	3,546,694	47.00	16.96	75,462	1,279,618
1985	32.5	3,785,522	47.00	16.18	80,543	1,303,159
1984	33.5	2,743,187	47.00	15.42	58,366	900,194
1983	34.5	1,574,543	47.00	14.69	33,501	492,189
1982	35.5	1,841,381	47.00	13.99	39,178	548,086
1981	36.5	2,334,832	47.00	13.32	49,677	661,798
1980	37.5	2,715,559	47.00	12.69	57,778	733,482
1979	38.5	2,484,343	47.00	12.11	52,858	640,325
1978	39.5	2,314,261	47.00	11.58	49,240	570,433
1977	40.5	1,274,555	47.00	11.11	27,118	301,326
1976	41.5	1,267,218	47.00	10.69	26,962	288,351
1975	42.5	1,133,262	47.00	10.33	24,112	249,157
1974	43.5	743,994	47.00	10.02	15,830	158,677
1973	44.5	36,684	47.00	9.76	781	7,618
1972	45.5	1,814	47.00	9.54	39	368
1971	46.5	7,614	47.00	9.34	162	1,514
1970	47.5	1,602	47.00	9.18	34	313
1969	48.5	0	47.00	9.03	0	0
1968	49.5	177	47.00	8.89	4	34
1967	50.5	343	47.00	8.75	7	64
1966	51.5	318	47.00	8.62	7	58
1965	52.5	167	47.00	8.47	4	30
1964	53.5	1,977	47.00	8.31	42	349
1963	54.5	182	47.00	8.14	4	31
1962	55.5	904	47.00	7.95	19	153
1961	56.5	232	47.00	7.75	5	38
1960	57.5	6,519	47.00	7.54	139	1,046
1959	58.5	690	47.00	7.32	15	107
1958	59.5	132	47.00	7.10	3	20
1957	60.5	231	47.00	6.88	5	34
1956	61.5	0	47.00	6.66	0	0
1955	62.5	0	47.00	6.44	0	0
1954	63.5	0	47.00	6.22	0	0
1953	64.5	0	47.00	6.01	0	0
1952	65.5	0	47.00	5.80	0	0
1951	66.5	0	47.00	5.60	0	0
1950	67.5	0	47.00	5.40	0	0
1949	68.5	0	47.00	5.21	0	0
1948	69.5	0	47.00	5.02	0	0
1947	70.5	0	47.00	4.84	0	0
1946	71.5	0	47.00	4.66	0	0
1945	72.5	12	47.00	4.48	0	1
		338,176,905			7,195,253	226,958,651

AVERAGE SERVICE LIFE	47.00
AVERAGE REMAINING LIFE	31.54

KGS 2017

378.00 -

Calculation of Remaining Life
Based Upon Broad Group/Vintage Group Procedures
Related to Original Cost as of December 31, 2017

Survivor Curve .. IOWA: 55 R1.5

			BG/VG Average			
		Surviving	Service	Remaining	ASL	RL
Year	Age	Investment	Life	Life	Weights	Weights
(1)	(2)	(3)	(4)	(5)	(6)=(3)/(4)	(7)=(6)*(5)
2017	0.5	116,463	55.00	54.59	2,118	115,588
2016	1.5	535,182	55.00	53.77	9,731	523,172
2015	2.5	546,194	55.00	52.95	9,931	525,824
2014	3.5	1,079,543	55.00	52.14	19,628	1,023,329
2013	4.5	370,551	55.00	51.33	6,737	345,808
2012	5.5	533,444	55.00	50.52	9,699	490,021
2011	6.5	730,112	55.00	49.72	13,275	660,061
2010	7.5	1,078,196	55.00	48.93	19,604	959,146
2009	8.5	363,260	55.00	48.14	6,605	317,922
2008	9.5	1,049,459	55.00	47.35	19,081	903,453
2007	10.5	661,384	55.00	46.56	12,025	559,950
2006	11.5	840,098	55.00	45.79	15,275	699,360
2005	12.5	853,513	55.00	45.01	15,518	698,511
2004	13.5	889,142	55.00	44.24	16,166	715,221
2003	14.5	903,021	55.00	43.48	16,419	713,811
2002	15.5	1,081,583	55.00	42.71	19,665	839,983
2001	16.5	490,265	55.00	41.96	8,914	374,001
2000	17.5	1,054,595	55.00	41.20	19,174	790,075
1999	18.5	512,356	55.00	40.46	9,316	376,876
1998	19.5	92,880	55.00	39.71	1,689	67,065
1997	20.5	154,256	55.00	38.97	2,805	109,309
1996	21.5	437,532	55.00	38.24	7,955	304,208
1995	22.5	514,593	55.00	37.51	9,356	350,970
1994	23.5	512,821	55.00	36.79	9,324	343,018
1993	24.5	1,509,055	55.00	36.07	27,437	989,690
1992	25.5	802,597	55.00	35.36	14,593	515,976
1991	26.5	1,080,139	55.00	34.65	19,639	680,528
1990	27.5	1,421,806	55.00	33.95	25,851	877,676
1989	28.5	417,678	55.00	33.26	7,594	252,561
1988	29.5	292,010	55.00	32.57	5,309	172,920

1987	30.5	490,912	55.00	31.89	8,926	284,623
1986	31.5	380,081	55.00	31.21	6,911	215,702
1985	32.5	273,071	55.00	30.55	4,965	151,656
1984	33.5	199,506	55.00	29.88	3,627	108,404
1983	34.5	383,514	55.00	29.23	6,973	203,832
1982	35.5	442,542	55.00	28.59	8,046	230,007
1981	36.5	113,996	55.00	27.95	2,073	57,925
1980	37.5	84,974	55.00	27.32	1,545	42,204
1979	38.5	117,596	55.00	26.69	2,138	57,074
1978	39.5	92,192	55.00	26.08	1,676	43,714
1977	40.5	70,046	55.00	25.47	1,274	32,441
1976	41.5	123,331	55.00	24.88	2,242	55,779
1975	42.5	33,030	55.00	24.29	601	14,585
1974	43.5	43,901	55.00	23.70	798	18,921
1973	44.5	96,623	55.00	23.13	1,757	40,638
1972	45.5	112,029	55.00	22.57	2,037	45,971
1971	46.5	105,055	55.00	22.02	1,910	42,051
1970	47.5	10,366	55.00	21.47	188	4,046
1969	48.5	28,290	55.00	20.93	514	10,768
1968	49.5	32,557	55.00	20.41	592	12,080
1967	50.5	27,186	55.00	19.89	494	9,832
1966	51.5	36,700	55.00	19.38	667	12,934
1965	52.5	13,451	55.00	18.89	245	4,619
1964	53.5	22,347	55.00	18.40	406	7,474
1963	54.5	21,068	55.00	17.92	383	6,863
1962	55.5	11,612	55.00	17.45	211	3,684
1961	56.5	11,903	55.00	16.99	216	3,677
1960	57.5	9,552	55.00	16.54	174	2,872
1959	58.5	14,855	55.00	16.10	270	4,348
1958	59.5	16,318	55.00	15.67	297	4,648
1957	60.5	25,659	55.00	15.24	467	7,111
1956	61.5	6,483	55.00	14.83	118	1,748
1955	62.5	4,671	55.00	14.43	85	1,225
1954	63.5	8,891	55.00	14.03	162	2,268
1953	64.5	4,168	55.00	13.64	76	1,034
1952	65.5	5,109	55.00	13.27	93	1,232
1951	66.5	5,694	55.00	12.90	104	1,335
1950	67.5	4,089	55.00	12.53	74	932
1949	68.5	4,270	55.00	12.18	78	945
1948	69.5	6,432	55.00	11.83	117	1,383
1947	70.5	1,571	55.00	11.49	29	328
1946	71.5	0	55.00	11.16	0	0
1945	72.5	84	55.00	10.83	2	17
1944	73.5	30	55.00	10.50	1	6
1943	74.5	221	55.00	10.19	4	41
1942	75.5	1,531	55.00	9.88	28	275
1941	76.5	915	55.00	9.57	17	159

1940	77.5	758	55.00	9.27	14	128
1939	78.5	0	55.00	8.97	0	0
1938	79.5	200	55.00	8.67	4	32
1937	80.5	46	55.00	8.38	1	7
1936	81.5	391	55.00	8.09	7	57
1935	82.5	868	55.00	7.81	16	123
1934	83.5	387	55.00	7.53	7	53
1933	84.5	0	55.00	7.26	0	0
1932	85.5	1,030	55.00	6.99	19	131
1931	86.5	1,293	55.00	6.72	24	158
1930	87.5	4,204	55.00	6.46	76	494
1929	88.5	2,034	55.00	6.20	37	229
1928	89.5	360	55.00	5.95	7	39
1927	90.5	29	55.00	5.71	1	3
1926	91.5	0	55.00	5.47	0	0
1925	92.5	255	55.00	5.24	5	24
1924	93.5	388	55.00	5.01	7	35
1923	94.5	617	55.00	4.78	11	54
1922	95.5	0	55.00	4.56	0	0
1921	96.5	177	55.00	4.33	3	14
1920	97.5	0	55.00	4.10	0	0
1919	98.5	0	55.00	3.86	0	0
1918	99.5	0	55.00	3.61	0	0
1917	100.5	0	55.00	3.33	0	0
1916	101.5	0	55.00	3.02	0	0
1915	102.5	91	55.00	2.70	2	4
1914	103.5	0	55.00	2.36	0	0
1913	104.5	0	55.00	2.03	0	0
1912	105.5	0	55.00	1.70	0	0
1911	106.5	0	55.00	1.37	0	0
1910	107.5	0	55.00	1.05	0	0
1909	108.5	0	55.00	0.75	0	0
1908	109.5	0	55.00	0.52	0	0
1907	110.5	0	55.00	0.50	0	0
1906	111.5	0	55.00	0.50	0	0
1905	112.5	0	55.00	0.50	0	0
1904	113.5	0	55.00	0.50	0	0
1903	114.5	0	55.00	0.50	0	0
1902	115.5	0	55.00	0.50	0	0
1901	116.5	0	55.00	0.50	0	0
1900	117.5	0	55.00	0.50	0	0
		24,435,280			444,278	18,051,032

AVERAGE SERVICE LIFE	55.00
AVERAGE REMAINING LIFE	40.63

Observed Life Table Results
Kansas Gas Service
Account: 379.00 - Meas. and Reg. Sta. Equip. - City Gate

Age	Exposures	Retirements	Retirement Ratio (%)	Survivor Ratio (%)	Cumulative Survivors
BAND		1907 - 2017			
0	7,939,880	0	0.0000	100.0000	1.0000
0.5	8,188,954	5,973	0.0729	99.9271	1.0000
1.5	7,671,576	16,071	0.2095	99.7905	0.9993
2.5	7,246,743	8,451	0.1166	99.8834	0.9972
3.5	7,066,650	7,437	0.1052	99.8948	0.9960
4.5	6,866,637	5,769	0.0840	99.9160	0.9950
5.5	6,124,482	27,894	0.4555	99.5445	0.9941
6.5	6,016,225	20,265	0.3368	99.6632	0.9896
7.5	5,974,925	24,815	0.4153	99.5847	0.9863
8.5	5,868,865	12,712	0.2166	99.7834	0.9822
9.5	5,861,378	6,003	0.1024	99.8976	0.9800
10.5	5,885,911	9,876	0.1678	99.8322	0.9790
11.5	5,928,217	16,849	0.2842	99.7158	0.9774
12.5	5,882,034	9,943	0.1690	99.8310	0.9746
13.5	5,883,004	7,489	0.1273	99.8727	0.9730
14.5	5,828,750	18,986	0.3257	99.6743	0.9717
15.5	5,678,400	11,075	0.1950	99.8050	0.9686
16.5	5,642,729	6,721	0.1191	99.8809	0.9667
17.5	5,374,803	4,835	0.0900	99.9100	0.9655
18.5	5,313,989	8,248	0.1552	99.8448	0.9647
19.5	5,301,661	16,058	0.3029	99.6971	0.9632
20.5	5,182,255	9,830	0.1897	99.8103	0.9602
21.5	4,673,057	14,637	0.3132	99.6868	0.9584
22.5	4,503,407	12,785	0.2839	99.7161	0.9554
23.5	3,699,940	1,158	0.0313	99.9687	0.9527
24.5	3,433,607	5,011	0.1460	99.8540	0.9524
25.5	3,381,779	17,993	0.5321	99.4679	0.9510
26.5	2,763,376	4,836	0.1750	99.8250	0.9460
27.5	2,481,432	15,687	0.6322	99.3678	0.9443
28.5	2,091,640	2,092	0.1000	99.9000	0.9383
29.5	1,816,687	3,768	0.2074	99.7926	0.9374
30.5	1,609,039	3,402	0.2114	99.7886	0.9355
31.5	1,214,680	6,887	0.5670	99.4330	0.9335
32.5	1,162,338	2,506	0.2156	99.7844	0.9282
33.5	1,141,885	1,617	0.1416	99.8584	0.9262
34.5	1,069,229	456	0.0426	99.9574	0.9249
35.5	988,016	1,528	0.1547	99.8453	0.9245
36.5	954,897	7,693	0.8057	99.1943	0.9230
37.5	870,369	854	0.0981	99.9019	0.9156
38.5	789,251	128	0.0162	99.9838	0.9147

39.5	771,621	1,950	0.2527	99.7473	0.9146
40.5	734,699	3,485	0.4743	99.5257	0.9123
41.5	580,266	6,583	1.1344	98.8656	0.9079
42.5	529,113	2,551	0.4821	99.5179	0.8976
43.5	482,723	1,157	0.2396	99.7604	0.8933
44.5	428,334	1,899	0.4433	99.5567	0.8912
45.5	390,328	1,172	0.3001	99.6999	0.8872
46.5	318,654	4,394	1.3789	98.6211	0.8845
47.5	305,506	3,306	1.0821	98.9179	0.8723
48.5	265,755	1,645	0.6190	99.3810	0.8629
49.5	259,133	8,573	3.3083	96.6917	0.8576
50.5	222,277	1,698	0.7638	99.2362	0.8292
51.5	197,424	2,058	1.0425	98.9575	0.8229
52.5	173,794	485	0.2793	99.7207	0.8143
53.5	127,520	191	0.1501	99.8499	0.8120
54.5	113,761	212	0.1867	99.8133	0.8108
55.5	106,025	1,608	1.5170	98.4830	0.8093
56.5	79,447	1,544	1.9430	98.0570	0.7970
57.5	68,513	2,400	3.5029	96.4971	0.7815
58.5	65,604	1,736	2.6466	97.3534	0.7541
59.5	41,931	1,393	3.3226	96.6774	0.7342
60.5	18,798	40	0.2128	99.7872	0.7098
61.5	17,189	417	2.4288	97.5712	0.7083
62.5	14,701	573	3.8950	96.1050	0.6911
63.5	10,350	1,787	17.2682	82.7318	0.6642
64.5	7,649	541	7.0731	92.9269	0.5495
65.5	4,797	321	6.6875	93.3125	0.5106
66.5	3,745	15	0.4019	99.5981	0.4765
67.5	3,689	0	0.0000	100.0000	0.4745
68.5	3,496	0	0.0000	100.0000	0.4745
69.5	3,496	0	0.0000	100.0000	0.4745
70.5	3,496	73	2.0993	97.9007	0.4745
71.5	3,423	712	20.7935	79.2065	0.4646
72.5	2,711	617	22.7570	77.2430	0.3680
73.5	2,069	36	1.7249	98.2751	0.2842
74.5	2,033	47	2.3340	97.6660	0.2793
75.5	1,927	82	4.2618	95.7382	0.2728
76.5	1,845	115	6.2109	93.7891	0.2612
77.5	1,730	0	0.0000	100.0000	0.2450
78.5	1,730	0	0.0000	100.0000	0.2450
79.5	1,730	0	0.0000	100.0000	0.2450
80.5	1,730	0	0.0000	100.0000	0.2450
81.5	1,730	91	5.2468	94.7532	0.2450
82.5	1,640	83	5.0793	94.9207	0.2321
83.5	1,556	0	0.0000	100.0000	0.2203
84.5	1,556	0	0.0000	100.0000	0.2203
85.5	1,183	0	0.0000	100.0000	0.2203

86.5	522	0	0.0000	100.0000	0.2203
87.5	415	0	0.0000	100.0000	0.2203
88.5	121	0	0.0000	100.0000	0.2203
89.5	121	0	0.0000	100.0000	0.2203
90.5	121	0	0.0000	100.0000	0.2203
91.5	121	0	0.0000	100.0000	0.2203
92.5	121	0	0.0000	100.0000	0.2203
93.5	71	0	0.0000	100.0000	0.2203
94.5	29	0	0.0000	100.0000	0.2203
95.5	29	0	0.0000	100.0000	0.2203
96.5	29	0	0.0000	100.0000	0.2203
97.5	29	0	0.0000	100.0000	0.2203
98.5	29	0	0.0000	100.0000	0.2203
99.5	29	0	0.0000	100.0000	0.2203
100.5	29	0	0.0000	100.0000	0.2203
101.5	29	0	0.0000	100.0000	0.2203
102.5	0	0	0.0000	100.0000	0.2203
103.5	0	0	0.0000	100.0000	0.2203
104.5	0	0	0.0000	100.0000	0.2203
105.5	0	0	0.0000	100.0000	0.2203
106.5	0	0	0.0000	100.0000	0.2203
107.5	0	0	0.0000	100.0000	0.2203
108.5	0	0	0.0000	100.0000	0.2203
109.5	0	0	0.0000	100.0000	0.2203

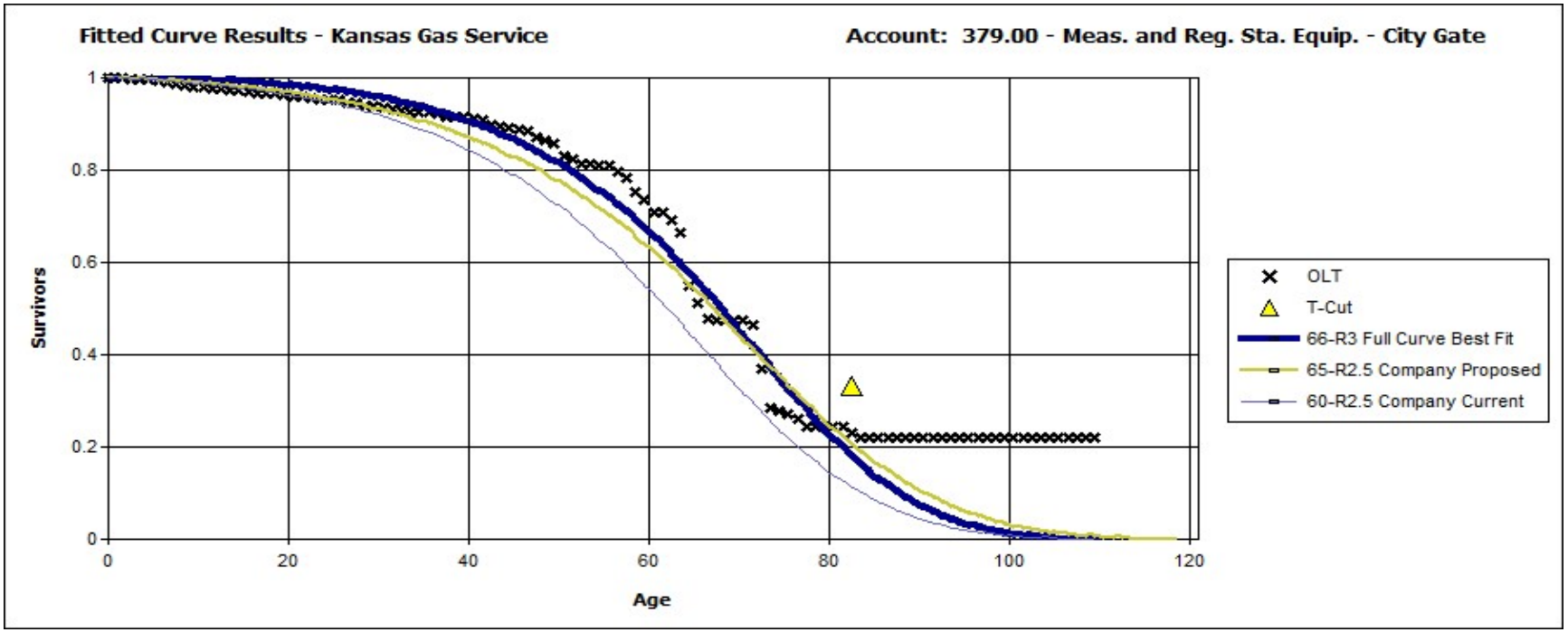
Best Fit Curve Results
Kansas Gas Service
Account: 379.00 - Meas. and Reg. Sta. Equip. - City Gate

Curve	Life	Sum of Squared Differences
BAND	**1907 - 2017**	
R3	66.0	994.662
S3	68.0	1,312.744
L4	69.0	1,466.922
R4	67.0	1,528.768
R2.5	66.0	1,788.979
L3	71.0	1,804.986
S2	68.0	2,144.015
S4	68.0	2,789.621
S1.5	69.0	3,171.865
R2	66.0	3,491.481
L5	68.0	4,075.147
L2	74.0	4,349.639
S1	69.0	4,776.884
R5	68.0	5,638.079
R1.5	67.0	5,799.695
L1.5	75.0	6,229.066
S0.5	70.0	6,656.429
S5	68.0	7,149.084
L1	78.0	8,833.980
R1	68.0	8,886.619
S0	72.0	9,064.099
L0.5	81.0	10,968.544
S-0.5	75.0	12,382.269
R0.5	72.0	12,680.642
L0	86.0	13,501.362
S6	68.0	13,814.068

O1	80.0	16,327.605
O2	90.0	16,335.548
O3	100.0	22,730.247
SQ	66.0	34,303.458
O4	100.0	40,993.558

Analytical Parameters

OLT Placement Band:	1907 - 2017
OLT Experience Band:	1907 - 2017
Minimum Life Parameter	1
Maximum Life Parameter	100
Life Increment Parameter	1
Max Age (T-Cut):	82.5



Analytical Parameters

OLT Placement Band:	1907 - 2017
OLT Experience Band:	1907 - 2017
Minimum Life Parameter:	1
Maximum Life Parameter:	100
Life Increment Parameter:	1
Max Age (T-Cut):	84.0

KGS 2017

379.00 -

Calculation of Remaining Life
Based Upon Broad Group/Vintage Group Procedures
Related to Original Cost as of December 31, 2017

Survivor Curve .. IOWA: 66 R3

			BG/VG Average			
Year	Age	Surviving Investment	Service Life	Remaining Life	ASL Weights	RL Weights
(1)	(2)	(3)	(4)	(5)	(6)=(3)/(4)	(7)=(6)*(5)
2017	0.5	324,314	66.00	65.51	4,914	321,888
2016	1.5	567,661	66.00	64.52	8,601	554,956
2015	2.5	438,241	66.00	63.54	6,640	421,916
2014	3.5	204,378	66.00	62.56	3,097	193,732
2013	4.5	269,680	66.00	61.58	4,086	251,640
2012	5.5	761,598	66.00	60.61	11,539	699,405
2011	6.5	102,590	66.00	59.64	1,554	92,702
2010	7.5	51,808	66.00	58.67	785	46,053
2009	8.5	100,911	66.00	57.70	1,529	88,225
2008	9.5	4,419	66.00	56.74	67	3,799
2007	10.5	8,294	66.00	55.78	126	7,009
2006	11.5	7,217	66.00	54.82	109	5,995
2005	12.5	37,756	66.00	53.87	572	30,818
2004	13.5	(240)	66.00	52.92	(4)	(192)
2003	14.5	56,560	66.00	51.98	857	44,544
2002	15.5	136,138	66.00	51.04	2,063	105,279
2001	16.5	37,933	66.00	50.10	575	28,797
2000	17.5	263,406	66.00	49.17	3,991	196,253
1999	18.5	57,282	66.00	48.25	868	41,875
1998	19.5	5,567	66.00	47.33	84	3,992
1997	20.5	104,179	66.00	46.41	1,578	73,262
1996	21.5	499,368	66.00	45.50	7,566	344,293
1995	22.5	155,014	66.00	44.60	2,349	104,752
1994	23.5	794,764	66.00	43.70	12,042	526,267
1993	24.5	265,608	66.00	42.81	4,024	172,289
1992	25.5	49,626	66.00	41.93	752	31,525
1991	26.5	616,273	66.00	41.05	9,337	383,279
1990	27.5	278,311	66.00	40.18	4,217	169,413
1989	28.5	374,244	66.00	39.31	5,670	222,901
1988	29.5	273,329	66.00	38.45	4,141	159,241

1987	30.5	203,880	66.00	37.60	3,089	116,149
1986	31.5	390,957	66.00	36.76	5,924	217,724
1985	32.5	45,454	66.00	35.92	689	24,737
1984	33.5	17,947	66.00	35.09	272	9,542
1983	34.5	71,949	66.00	34.27	1,090	37,355
1982	35.5	80,807	66.00	33.45	1,224	40,956
1981	36.5	34,597	66.00	32.64	524	17,112
1980	37.5	77,716	66.00	31.85	1,178	37,499
1979	38.5	82,371	66.00	31.06	1,248	38,758
1978	39.5	17,837	66.00	30.27	270	8,181
1977	40.5	34,972	66.00	29.50	530	15,630
1976	41.5	151,312	66.00	28.73	2,293	65,871
1975	42.5	44,819	66.00	27.98	679	18,997
1974	43.5	43,839	66.00	27.23	664	18,085
1973	44.5	53,705	66.00	26.49	814	21,553
1972	45.5	36,398	66.00	25.76	551	14,205
1971	46.5	70,502	66.00	25.04	1,068	26,746
1970	47.5	8,754	66.00	24.33	133	3,227
1969	48.5	36,444	66.00	23.63	552	13,046
1968	49.5	17,934	66.00	22.94	272	6,232
1967	50.5	28,283	66.00	22.26	429	9,538
1966	51.5	23,155	66.00	21.59	351	7,574
1965	52.5	21,990	66.00	20.93	333	6,974
1964	53.5	45,818	66.00	20.29	694	14,082
1963	54.5	13,567	66.00	19.65	206	4,040
1962	55.5	7,524	66.00	19.03	114	2,170
1961	56.5	24,969	66.00	18.42	378	6,969
1960	57.5	9,390	66.00	17.83	142	2,536
1959	58.5	509	66.00	17.24	8	133
1958	59.5	22,001	66.00	16.67	333	5,558
1957	60.5	21,740	66.00	16.12	329	5,310
1956	61.5	1,678	66.00	15.58	25	396
1955	62.5	2,071	66.00	15.05	31	472
1954	63.5	3,778	66.00	14.54	57	832
1953	64.5	914	66.00	14.04	14	194
1952	65.5	2,311	66.00	13.56	35	475
1951	66.5	731	66.00	13.09	11	145
1950	67.5	41	66.00	12.63	1	8
1949	68.5	193	66.00	12.19	3	36
1948	69.5	0	66.00	11.76	0	0
1947	70.5	0	66.00	11.35	0	0
1946	71.5	0	66.00	10.95	0	0
1945	72.5	0	66.00	10.57	0	0
1944	73.5	25	66.00	10.19	0	4
1943	74.5	0	66.00	9.83	0	0
1942	75.5	59	66.00	9.49	1	8
1941	76.5	0	66.00	9.15	0	0

1940	77.5	0	66.00	8.82	0	0
1939	78.5	0	66.00	8.51	0	0
1938	79.5	0	66.00	8.20	0	0
1937	80.5	0	66.00	7.91	0	0
1936	81.5	0	66.00	7.61	0	0
1935	82.5	0	66.00	7.33	0	0
1934	83.5	0	66.00	7.06	0	0
1933	84.5	0	66.00	6.79	0	0
1932	85.5	373	66.00	6.52	6	37
1931	86.5	661	66.00	6.26	10	63
1930	87.5	107	66.00	5.99	2	10
1929	88.5	294	66.00	5.74	4	26
1928	89.5	0	66.00	5.47	0	0
1927	90.5	0	66.00	5.22	0	0
1926	91.5	0	66.00	4.96	0	0
1925	92.5	0	66.00	4.71	0	0
1924	93.5	50	66.00	4.45	1	3
1923	94.5	42	66.00	4.19	1	3
1922	95.5	0	66.00	3.93	0	0
1921	96.5	0	66.00	3.68	0	0
1920	97.5	0	66.00	3.42	0	0
1919	98.5	0	66.00	3.17	0	0
1918	99.5	0	66.00	2.92	0	0
1917	100.5	0	66.00	2.67	0	0
1916	101.5	0	66.00	2.42	0	0
1915	102.5	29	66.00	2.18	0	1
1914	103.5	0	66.00	1.94	0	0
1913	104.5	0	66.00	1.70	0	0
1912	105.5	0	66.00	1.48	0	0
1911	106.5	0	66.00	1.25	0	0
1910	107.5	0	66.00	1.04	0	0
1909	108.5	0	66.00	0.82	0	0
1908	109.5	0	66.00	0.65	0	0
1907	110.5	0	66.00	0.50	0	0
		8,600,727			130,314	6,145,106

AVERAGE SERVICE LIFE	66.00
AVERAGE REMAINING LIFE	47.16

KGS 2017

380.10 -

Calculation of Remaining Life
Based Upon Broad Group/Vintage Group Procedures
Related to Original Cost as of December 31, 2017

Survivor Curve .. IOWA: 50 R1.5

			BG/VG Average			
Year	Age	Surviving Investment	Service Life	Remaining Life	ASL Weights	RL Weights
(1)	(2)	(3)	(4)	(5)	(6)=(3)/(4)	(7)=(6)*(5)
2017	0.5	96,585	50.00	49.59	1,932	95,786
2016	1.5	2,030,651	50.00	48.77	40,613	1,980,537
2015	2.5	253,142	50.00	47.95	5,063	242,763
2014	3.5	367,360	50.00	47.14	7,347	346,335
2013	4.5	130,170	50.00	46.33	2,603	120,620
2012	5.5	238,292	50.00	45.53	4,766	216,986
2011	6.5	701,072	50.00	44.73	14,021	627,203
2010	7.5	81,203	50.00	43.94	1,624	71,359
2009	8.5	191,876	50.00	43.15	3,838	165,591
2008	9.5	92,014	50.00	42.37	1,840	77,968
2007	10.5	80,937	50.00	41.59	1,619	67,321
2006	11.5	220,593	50.00	40.81	4,412	180,067
2005	12.5	97,331	50.00	40.05	1,947	77,952
2004	13.5	95,272	50.00	39.28	1,905	74,846
2003	14.5	102,646	50.00	38.52	2,053	79,080
2002	15.5	174,747	50.00	37.77	3,495	131,990
2001	16.5	72,620	50.00	37.02	1,452	53,762
2000	17.5	96,780	50.00	36.27	1,936	70,206
1999	18.5	65,253	50.00	35.53	1,305	46,371
1998	19.5	5,570	50.00	34.80	111	3,876
1997	20.5	46,693	50.00	34.07	934	31,815
1996	21.5	65,205	50.00	33.35	1,304	43,486
1995	22.5	43,160	50.00	32.63	863	28,165
1994	23.5	62,816	50.00	31.92	1,256	40,100
1993	24.5	59,296	50.00	31.21	1,186	37,018
1992	25.5	89,531	50.00	30.52	1,791	54,644
1991	26.5	127,993	50.00	29.83	2,560	76,352
1990	27.5	51,431	50.00	29.14	1,029	29,977
1989	28.5	12,680,376	50.00	28.47	253,608	7,219,473
1988	29.5	83,916	50.00	27.80	1,678	46,655

1987	30.5	118,063	50.00	27.14	2,361	64,080
1986	31.5	75,614	50.00	26.49	1,512	40,053
1985	32.5	125,969	50.00	25.84	2,519	65,103
1984	33.5	121,149	50.00	25.20	2,423	61,071
1983	34.5	111,203	50.00	24.58	2,224	54,661
1982	35.5	158,187	50.00	23.96	3,164	75,799
1981	36.5	178,355	50.00	23.35	3,567	83,288
1980	37.5	186,486	50.00	22.75	3,730	84,845
1979	38.5	206,563	50.00	22.16	4,131	91,537
1978	39.5	223,842	50.00	21.58	4,477	96,590
1977	40.5	215,603	50.00	21.00	4,312	90,568
1976	41.5	224,674	50.00	20.44	4,493	91,851
1975	42.5	221,476	50.00	19.89	4,430	88,097
1974	43.5	167,823	50.00	19.35	3,356	64,935
1973	44.5	2,122,952	50.00	18.81	42,459	798,839
1972	45.5	1,120,911	50.00	18.29	22,418	410,086
1971	46.5	1,459,665	50.00	17.78	29,193	519,090
1970	47.5	1,000,874	50.00	17.28	20,017	345,905
1969	48.5	690,778	50.00	16.79	13,816	231,958
1968	49.5	1,233,945	50.00	16.31	24,679	402,505
1967	50.5	528,589	50.00	15.84	10,572	167,459
1966	51.5	550,451	50.00	15.38	11,009	169,333
1965	52.5	369,633	50.00	14.93	7,393	110,393
1964	53.5	85,046	50.00	14.49	1,701	24,654
1963	54.5	76,129	50.00	14.07	1,523	21,418
1962	55.5	149,921	50.00	13.65	2,998	40,926
1961	56.5	192,237	50.00	13.24	3,845	50,910
1960	57.5	339,857	50.00	12.84	6,797	87,299
1959	58.5	197,865	50.00	12.46	3,957	49,289
1958	59.5	174,364	50.00	12.08	3,487	42,112
1957	60.5	1,865	50.00	11.71	37	437
1956	61.5	0	50.00	11.34	0	0
1955	62.5	0	50.00	10.99	0	0
1954	63.5	984	50.00	10.65	20	209
1953	64.5	1,329	50.00	10.31	27	274
1952	65.5	0	50.00	9.98	0	0
1951	66.5	11,722	50.00	9.65	234	2,263
1950	67.5	14,140	50.00	9.33	283	2,639
1949	68.5	6,323	50.00	9.02	126	1,141
1948	69.5	371	50.00	8.71	7	65
1947	70.5	0	50.00	8.41	0	0
1946	71.5	0	50.00	8.11	0	0
1945	72.5	215,460	50.00	7.82	4,309	33,687
1944	73.5	0	50.00	7.53	0	0
1943	74.5	0	50.00	7.24	0	0
1942	75.5	340	50.00	6.96	7	47
1941	76.5	0	50.00	6.68	0	0

1940	77.5	0	50.00	6.41	0	0
1939	78.5	0	50.00	6.15	0	0
1938	79.5	505	50.00	5.88	10	59
1937	80.5	0	50.00	5.63	0	0
1936	81.5	505	50.00	5.38	10	54
1935	82.5	161,412	50.00	5.13	3,228	16,575
1934	83.5	0	50.00	4.90	0	0
1933	84.5	0	50.00	4.67	0	0
1932	85.5	0	50.00	4.44	0	0
1931	86.5	0	50.00	4.22	0	0
1930	87.5	0	50.00	3.99	0	0
1929	88.5	0	50.00	3.76	0	0
1928	89.5	6,917	50.00	3.52	138	488
1927	90.5	0	50.00	3.27	0	0
1926	91.5	0	50.00	2.99	0	0
1925	92.5	30,178	50.00	2.68	604	1,616
		31,584,806			631,696	16,922,515

AVERAGE SERVICE LIFE	50.00
AVERAGE REMAINING LIFE	26.79

KGS 2017

380.20 -

Calculation of Remaining Life
Based Upon Broad Group/Vintage Group Procedures
Related to Original Cost as of December 31, 2017

Survivor Curve .. IOWA: 45 R3

			BG/VG Average			
		Surviving	Service	Remaining	ASL	RL
Year	Age	Investment	Life	Life	Weights	Weights
(1)	(2)	(3)	(4)	(5)	(6)=(3)/(4)	(7)=(6)*(5)
2017	0.5	33,222,209	45.00	44.51	738,271	32,858,078
2016	1.5	36,659,706	45.00	43.52	814,660	35,457,539
2015	2.5	9,492,115	45.00	42.54	210,936	8,974,242
2014	3.5	23,279,213	45.00	41.57	517,316	21,504,163
2013	4.5	20,964,151	45.00	40.60	465,870	18,912,589
2012	5.5	16,174,232	45.00	39.63	359,427	14,243,438
2011	6.5	13,681,764	45.00	38.66	304,039	11,755,515
2010	7.5	12,873,614	45.00	37.71	286,080	10,786,865
2009	8.5	8,165,091	45.00	36.75	181,446	6,668,577
2008	9.5	12,895,054	45.00	35.80	286,557	10,260,102
2007	10.5	9,897,390	45.00	34.86	219,942	7,667,977
2006	11.5	11,357,356	45.00	33.93	252,386	8,563,227
2005	12.5	13,114,267	45.00	33.00	291,428	9,617,608
2004	13.5	13,095,691	45.00	32.08	291,015	9,336,242
2003	14.5	12,785,470	45.00	31.17	284,122	8,856,050
2002	15.5	11,065,618	45.00	30.27	245,903	7,442,623
2001	16.5	7,352,870	45.00	29.37	163,397	4,799,266
2000	17.5	5,650,197	45.00	28.49	125,560	3,576,706
1999	18.5	11,621,727	45.00	27.61	258,261	7,130,549
1998	19.5	3,924,986	45.00	26.74	87,222	2,332,640
1997	20.5	7,546,462	45.00	25.89	167,699	4,341,321
1996	21.5	10,579,002	45.00	25.04	235,089	5,887,008
1995	22.5	12,878,291	45.00	24.21	286,184	6,927,428
1994	23.5	10,876,708	45.00	23.38	241,705	5,651,597
1993	24.5	13,616,208	45.00	22.57	302,582	6,829,094
1992	25.5	10,310,997	45.00	21.77	229,133	4,987,735
1991	26.5	17,174,932	45.00	20.98	381,665	8,006,536
1990	27.5	14,177,987	45.00	20.20	315,066	6,364,428
1989	28.5	1,796,328	45.00	19.44	39,918	775,827
1988	29.5	7,056,225	45.00	18.68	156,805	2,929,591

1987	30.5	6,146,551	45.00	17.94	136,590	2,450,937
1986	31.5	5,428,070	45.00	17.22	120,624	2,076,899
1985	32.5	5,818,607	45.00	16.51	129,302	2,134,423
1984	33.5	5,113,026	45.00	15.81	113,623	1,796,504
1983	34.5	4,520,669	45.00	15.13	100,459	1,519,976
1982	35.5	4,596,542	45.00	14.47	102,145	1,477,565
1981	36.5	4,770,266	45.00	13.82	106,006	1,464,737
1980	37.5	4,793,311	45.00	13.19	106,518	1,404,715
1979	38.5	4,970,458	45.00	12.58	110,455	1,389,044
1978	39.5	4,197,536	45.00	11.98	93,279	1,117,711
1977	40.5	4,613,061	45.00	11.41	102,512	1,169,526
1976	41.5	3,960,653	45.00	10.86	88,015	955,464
1975	42.5	2,739,821	45.00	10.32	60,885	628,530
1974	43.5	1,239,856	45.00	9.81	27,552	270,329
1973	44.5	113,792	45.00	9.32	2,529	23,569
1972	45.5	28,350	45.00	8.85	630	5,576
1971	46.5	0	45.00	8.40	0	0
1970	47.5	0	45.00	7.98	0	0
1969	48.5	0	45.00	7.57	0	0
1968	49.5	68	45.00	7.18	2	11
1967	50.5	0	45.00	6.81	0	0
1966	51.5	0	45.00	6.46	0	0
1965	52.5	0	45.00	6.13	0	0
1964	53.5	0	45.00	5.81	0	0
1963	54.5	0	45.00	5.51	0	0
1962	55.5	0	45.00	5.22	0	0
		456,336,500			10,140,811	313,330,073

AVERAGE SERVICE LIFE	45.00
AVERAGE REMAINING LIFE	30.90

Observed Life Table Results
Kansas Gas Service
Account: 381.00 - Meters

Age	Exposures	Retirements	Retirement Ratio (%)	Survivor Ratio (%)	Cumulative Survivors
BAND		1900 - 2017			
0	121,501,036	158,666	0.1306	99.8694	1.0000
0.5	118,037,500	3,403,912	2.8838	97.1162	0.9987
1.5	124,968,098	426,149	0.3410	99.6590	0.9699
2.5	131,999,325	340,518	0.2580	99.7420	0.9666
3.5	137,451,640	202,938	0.1476	99.8524	0.9641
4.5	98,535,796	1,831,934	1.8592	98.1408	0.9627
5.5	93,239,998	193,277	0.2073	99.7927	0.9448
6.5	90,492,232	88,725	0.0980	99.9020	0.9428
7.5	86,586,448	1,732,206	2.0006	97.9994	0.9419
8.5	79,373,554	148,289	0.1868	99.8132	0.9230
9.5	72,781,397	83,687	0.1150	99.8850	0.9213
10.5	70,053,794	88,953	0.1270	99.8730	0.9203
11.5	65,283,388	84,556	0.1295	99.8705	0.9191
12.5	64,686,124	146,973	0.2272	99.7728	0.9179
13.5	63,887,860	211,019	0.3303	99.6697	0.9158
14.5	63,996,321	647,752	1.0122	98.9878	0.9128
15.5	44,920,891	179,600	0.3998	99.6002	0.9036
16.5	43,060,000	194,150	0.4509	99.5491	0.8999
17.5	40,216,320	193,367	0.4808	99.5192	0.8959
18.5	37,620,080	193,248	0.5137	99.4863	0.8916
19.5	36,262,967	317,694	0.8761	99.1239	0.8870
20.5	36,040,502	323,480	0.8975	99.1025	0.8792
21.5	33,564,195	327,695	0.9763	99.0237	0.8713
22.5	31,537,688	383,277	1.2153	98.7847	0.8628
23.5	26,643,345	276,280	1.0370	98.9630	0.8523
24.5	24,292,391	312,667	1.2871	98.7129	0.8435
25.5	22,630,580	275,451	1.2172	98.7828	0.8326
26.5	21,717,957	264,773	1.2191	98.7809	0.8225
27.5	21,175,457	251,810	1.1892	98.8108	0.8125
28.5	20,050,230	320,045	1.5962	98.4038	0.8028
29.5	18,658,631	279,836	1.4998	98.5002	0.7900
30.5	17,969,691	308,092	1.7145	98.2855	0.7782
31.5	16,647,106	320,359	1.9244	98.0756	0.7648
32.5	15,433,346	324,664	2.1037	97.8963	0.7501
33.5	14,449,432	295,392	2.0443	97.9557	0.7343
34.5	13,792,856	318,897	2.3120	97.6880	0.7193
35.5	13,192,708	632,632	4.7953	95.2047	0.7027
36.5	12,054,289	406,768	3.3745	96.6255	0.6690
37.5	10,004,201	352,046	3.5190	96.4810	0.6464
38.5	9,000,132	545,624	6.0624	93.9376	0.6237

39.5	8,051,131	524,788	6.5182	93.4818	0.5859
40.5	7,338,296	437,977	5.9684	94.0316	0.5477
41.5	6,810,416	490,571	7.2032	92.7968	0.5150
42.5	6,347,359	385,355	6.0711	93.9289	0.4779
43.5	5,586,607	439,885	7.8739	92.1261	0.4489
44.5	4,805,836	501,392	10.4330	89.5670	0.4135
45.5	4,295,696	458,393	10.6710	89.3290	0.3704
46.5	3,522,860	398,158	11.3021	88.6979	0.3309
47.5	2,846,807	323,784	11.3736	88.6264	0.2935
48.5	2,274,070	376,194	16.5428	83.4572	0.2601
49.5	2,023,845	470,530	23.2493	76.7507	0.2171
50.5	1,465,046	150,306	10.2594	89.7406	0.1666
51.5	1,288,774	114,582	8.8908	91.1092	0.1495
52.5	1,156,669	71,453	6.1774	93.8226	0.1362
53.5	1,052,591	90,983	8.6437	91.3563	0.1278
54.5	947,777	104,295	11.0041	88.9959	0.1168
55.5	845,244	54,035	6.3928	93.6072	0.1039
56.5	791,570	51,947	6.5625	93.4375	0.0973
57.5	743,997	53,582	7.2019	92.7981	0.0909
58.5	691,305	47,961	6.9377	93.0623	0.0843
59.5	645,862	45,972	7.1179	92.8821	0.0785
60.5	602,798	40,523	6.7224	93.2776	0.0729
61.5	565,702	35,870	6.3408	93.6592	0.0680
62.5	530,160	31,846	6.0069	93.9931	0.0637
63.5	498,392	19,766	3.9659	96.0341	0.0599
64.5	478,984	20,305	4.2391	95.7609	0.0575
65.5	606,032	12,401	2.0463	97.9537	0.0550
66.5	598,285	338,788	56.6265	43.3735	0.0539
67.5	359,816	11,045	3.0697	96.9303	0.0234
68.5	412,227	8,858	2.1488	97.8512	0.0227
69.5	403,370	8,998	2.2306	97.7694	0.0222
70.5	394,372	6,876	1.7436	98.2564	0.0217
71.5	387,496	8,600	2.2193	97.7807	0.0213
72.5	378,896	10,628	2.8051	97.1949	0.0208
73.5	368,268	4,243	1.1523	98.8477	0.0203
74.5	364,024	2,875	0.7899	99.2101	0.0200
75.5	361,149	5,253	1.4546	98.5454	0.0199
76.5	355,895	7,455	2.0948	97.9052	0.0196
77.5	348,440	4,263	1.2235	98.7765	0.0192
78.5	344,177	4,932	1.4331	98.5669	0.0189
79.5	339,244	3,635	1.0715	98.9285	0.0187
80.5	335,609	2,708	0.8068	99.1932	0.0185
81.5	332,901	3,906	1.1732	98.8268	0.0183
82.5	328,996	1,915	0.5822	99.4178	0.0181
83.5	327,081	3,441	1.0520	98.9480	0.0180
84.5	323,640	3,196	0.9875	99.0125	0.0178
85.5	320,444	1,790	0.5587	99.4413	0.0176

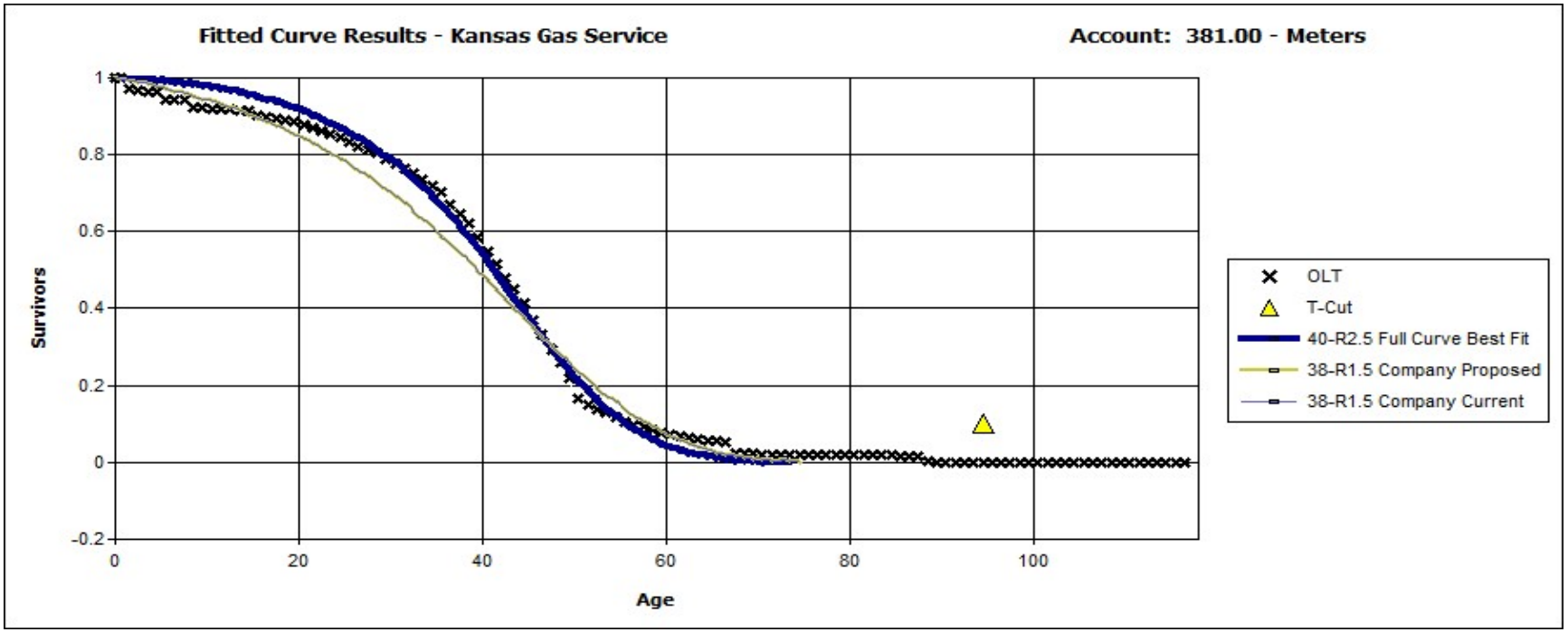
86.5	318,654	62,201	19.5199	80.4801	0.0175
87.5	256,453	175,388	68.3899	31.6101	0.0141
88.5	81,065	75,419	93.0360	6.9640	0.0045
89.5	5,645	1,091	19.3222	80.6778	0.0003
90.5	4,555	1,155	25.3697	74.6303	0.0003
91.5	3,399	1,305	38.4037	61.5963	0.0002
92.5	2,094	104	4.9898	95.0102	0.0001
93.5	1,989	1,296	65.1627	34.8373	0.0001
94.5	693	693	99.9524	0.0476	0.0000
95.5	0	0	0.0000	100.0000	0.0000
96.5	0	0	100.0000	0.0000	0.0000
97.5	0	0	0.0000	100.0000	0.0000
98.5	0	0	0.0000	100.0000	0.0000
99.5	0	0	0.0000	100.0000	0.0000
100.5	0	0	0.0000	100.0000	0.0000
101.5	0	0	0.0000	100.0000	0.0000
102.5	0	0	0.0000	100.0000	0.0000
103.5	0	0	0.0000	100.0000	0.0000
104.5	0	0	0.0000	100.0000	0.0000
105.5	0	0	0.0000	100.0000	0.0000
106.5	0	0	0.0000	100.0000	0.0000
107.5	0	0	0.0000	100.0000	0.0000
108.5	0	0	0.0000	100.0000	0.0000
109.5	0	0	0.0000	100.0000	0.0000
110.5	0	0	0.0000	100.0000	0.0000
111.5	0	0	0.0000	100.0000	0.0000
112.5	0	0	0.0000	100.0000	0.0000
113.5	0	0	0.0000	100.0000	0.0000
114.5	0	0	0.0000	100.0000	0.0000
115.5	0	0	0.0000	100.0000	0.0000
116.5	0	0	0.0000	100.0000	0.0000

Best Fit Curve Results
Kansas Gas Service
Account: 381.00 - Meters

Curve	Life	Sum of Squared Differences
BAND	**1900 - 2017**	
R2.5	40.0	770.711
R2	40.0	929.768
R3	41.0	1,533.545
S1.5	40.0	1,541.159
S2	41.0	1,541.772
R1.5	39.0	1,601.717
S1	40.0	2,091.802
L3	42.0	2,367.550
S3	41.0	2,652.135
S0.5	39.0	3,088.165
R1	38.0	3,234.862
L4	42.0	3,549.720
L2	41.0	3,711.781
R4	41.0	4,027.680
S0	39.0	4,637.333
L1.5	41.0	4,926.842
S4	42.0	5,839.416
R0.5	38.0	6,179.468
L1	40.0	6,846.951
S-0.5	38.0	7,113.755
L5	42.0	7,179.158
R5	42.0	8,866.146
L0.5	40.0	9,100.119
S5	42.0	10,375.454
O1	37.0	10,464.006
L0	39.0	12,066.731
O2	40.0	14,397.994
S6	42.0	15,660.864
O3	46.0	29,002.577
SQ	42.0	30,054.634
O4	59.0	37,669.759

Analytical Parameters

OLT Placement Band:	1900 - 2017
OLT Experience Band:	1900 - 2017
Minimum Life Parameter	1
Maximum Life Paramete	100
Life Increment Paramete	1
Max Age (T-Cut):	94.5



Analytical Parameters

OLT Placement Band:	1900 - 2017
OLT Experience Band:	1900 - 2017
Minimum Life Parameter:	1
Maximum Life Parameter:	100
Life Increment Parameter:	1
Max Age (T-Cut):	96.0

KGS 2017

381.00 -

Calculation of Remaining Life
Based Upon Broad Group/Vintage Group Procedures
Related to Original Cost as of December 31, 2017

Survivor Curve .. IOWA: 38 R1.5

			BG/VG Average			
		Surviving	Service	Remaining	ASL	RL
Year	Age	Investment	Life	Life	Weights	Weights
(1)	(2)	(3)	(4)	(5)	(6)=(3)/(4)	(7)=(6)*(5)
2017	0.5	30,126	38.00	37.59	793	29,799
2016	1.5	33,214	38.00	36.77	874	32,138
2015	2.5	143,242	38.00	35.96	3,770	135,534
2014	3.5	91,592	38.00	35.15	2,410	84,718
2013	4.5	38,526,538	38.00	34.35	1,013,856	34,822,948
2012	5.5	1,433,122	38.00	33.55	37,714	1,265,380
2011	6.5	2,111,592	38.00	32.76	55,568	1,820,606
2010	7.5	4,364,845	38.00	31.98	114,864	3,673,478
2009	8.5	5,824,964	38.00	31.20	153,289	4,783,332
2008	9.5	6,827,850	38.00	30.43	179,680	5,468,491
2007	10.5	2,988,486	38.00	29.67	78,644	2,333,457
2006	11.5	4,951,025	38.00	28.91	130,290	3,767,150
2005	12.5	976,619	38.00	28.16	25,700	723,790
2004	13.5	1,094,297	38.00	27.42	28,797	789,574
2003	14.5	90,244	38.00	26.68	2,375	63,363
2002	15.5	18,810,925	38.00	25.95	495,024	12,846,304
2001	16.5	2,124,204	38.00	25.23	55,900	1,410,274
2000	17.5	3,086,317	38.00	24.51	81,219	1,990,984
1999	18.5	2,794,843	38.00	23.81	73,549	1,751,033
1998	19.5	1,442,753	38.00	23.11	37,967	877,442
1997	20.5	162,065	38.00	22.42	4,265	95,628
1996	21.5	2,362,964	38.00	21.74	62,183	1,352,092
1995	22.5	1,824,326	38.00	21.07	48,009	1,011,771
1994	23.5	4,576,400	38.00	20.42	120,432	2,458,758
1993	24.5	2,100,259	38.00	19.77	55,270	1,092,602
1992	25.5	1,376,114	38.00	19.13	36,214	692,814
1991	26.5	694,156	38.00	18.51	18,267	338,052
1990	27.5	350,534	38.00	17.89	9,225	165,047
1989	28.5	909,398	38.00	17.29	23,932	413,772
1988	29.5	1,101,154	38.00	16.70	28,978	483,941

1987	30.5	440,516	38.00	16.12	11,593	186,910
1986	31.5	1,052,068	38.00	15.56	27,686	430,765
1985	32.5	931,821	38.00	15.01	24,522	368,018
1984	33.5	671,586	38.00	14.47	17,673	255,731
1983	34.5	370,359	38.00	13.95	9,746	135,917
1982	35.5	292,395	38.00	13.43	7,695	103,376
1981	36.5	522,950	38.00	12.94	13,762	178,045
1980	37.5	1,670,727	38.00	12.45	43,966	547,585
1979	38.5	694,084	38.00	11.99	18,265	218,915
1978	39.5	461,176	38.00	11.53	12,136	139,926
1977	40.5	231,123	38.00	11.09	6,082	67,439
1976	41.5	118,253	38.00	10.66	3,112	33,172
1975	42.5	13,399	38.00	10.24	353	3,612
1974	43.5	416,087	38.00	9.84	10,950	107,776
1973	44.5	366,626	38.00	9.45	9,648	91,209
1972	45.5	68,780	38.00	9.08	1,810	16,429
1971	46.5	329,706	38.00	8.71	8,676	75,581
1970	47.5	291,910	38.00	8.36	7,682	64,195
1969	48.5	268,007	38.00	8.01	7,053	56,510
1968	49.5	210,563	38.00	7.68	5,541	42,544
1967	50.5	103,094	38.00	7.35	2,713	19,947
1966	51.5	37,320	38.00	7.03	982	6,908
1965	52.5	28,814	38.00	6.72	758	5,098
1964	53.5	42,531	38.00	6.42	1,119	7,185
1963	54.5	16,830	38.00	6.12	443	2,711
1962	55.5	311	38.00	5.83	8	48
1961	56.5	0	38.00	5.54	0	0
1960	57.5	0	38.00	5.26	0	0
1959	58.5	0	38.00	4.99	0	0
1958	59.5	310	38.00	4.72	8	39
1957	60.5	0	38.00	4.46	0	0
1956	61.5	0	38.00	4.20	0	0
1955	62.5	0	38.00	3.96	0	0
1954	63.5	0	38.00	3.72	0	0
1953	64.5	0	38.00	3.49	0	0
1952	65.5	0	38.00	3.27	0	0
1951	66.5	0	38.00	3.05	0	0
1950	67.5	0	38.00	2.81	0	0
1949	68.5	0	38.00	2.57	0	0
1948	69.5	0	38.00	2.30	0	0
1947	70.5	0	38.00	1.98	0	0
1946	71.5	0	38.00	1.66	0	0
1945	72.5	0	38.00	1.33	0	0
1944	73.5	0	38.00	1.00	0	0
1943	74.5	0	38.00	0.71	0	0
1942	75.5	0	38.00	0.50	0	0
1941	76.5	0	38.00	0.50	0	0

1940	77.5	0	38.00	0.50	0	0
1939	78.5	0	38.00	0.50	0	0
1938	79.5	0	38.00	0.50	0	0
1937	80.5	0	38.00	0.50	0	0
1936	81.5	0	38.00	0.50	0	0
1935	82.5	0	38.00	0.50	0	0
1934	83.5	0	38.00	0.50	0	0
1933	84.5	0	38.00	0.50	0	0
1932	85.5	0	38.00	0.50	0	0
1931	86.5	0	38.00	0.50	0	0
1930	87.5	0	38.00	0.50	0	0
1929	88.5	0	38.00	0.50	0	0
1928	89.5	0	38.00	0.50	0	0
1927	90.5	0	38.00	0.50	0	0
1926	91.5	0	38.00	0.50	0	0
1925	92.5	0	38.00	0.50	0	0
1924	93.5	0	38.00	0.50	0	0
1923	94.5	0	38.00	0.50	0	0
1922	95.5	0	38.00	0.50	0	0
1921	96.5	0	38.00	0.50	0	0
1920	97.5	0	38.00	0.50	0	0
1919	98.5	0	38.00	0.50	0	0
1918	99.5	0	38.00	0.50	0	0
1917	100.5	0	38.00	0.50	0	0
1916	101.5	0	38.00	0.50	0	0
1915	102.5	0	38.00	0.50	0	0
1914	103.5	0	38.00	0.50	0	0
1913	104.5	0	38.00	0.50	0	0
1912	105.5	0	38.00	0.50	0	0
1911	106.5	0	38.00	0.50	0	0
1910	107.5	0	38.00	0.50	0	0
1909	108.5	0	38.00	0.50	0	0
1908	109.5	0	38.00	0.50	0	0
1907	110.5	0	38.00	0.50	0	0
1906	111.5	0	38.00	0.50	0	0
1905	112.5	0	38.00	0.50	0	0
1904	113.5	0	38.00	0.50	0	0
1903	114.5	0	38.00	0.50	0	0
1902	115.5	0	38.00	0.50	0	0
1901	116.5	0	38.00	0.50	0	0
1900	117.5	0	38.00	0.50	0	0
		122,855,513			3,233,040	89,939,861

AVERAGE SERVICE LIFE	38.00
AVERAGE REMAINING LIFE	27.82

Observed Life Table Results
Kansas Gas Service
Account: 382.00 - Meter Installs

Age	Exposures	Retirements	Retirement Ratio (%)	Survivor Ratio (%)	Cumulative Survivors
BAND		1900 - 2017			
0	102,088,241	13,142	0.0129	99.9871	1.0000
0.5	94,445,159	159,164	0.1685	99.8315	0.9999
1.5	97,062,325	160,648	0.1655	99.8345	0.9982
2.5	96,447,690	751,891	0.7796	99.2204	0.9965
3.5	94,327,654	148,314	0.1572	99.8428	0.9888
4.5	92,842,591	134,993	0.1454	99.8546	0.9872
5.5	91,064,784	145,395	0.1597	99.8403	0.9858
6.5	89,616,331	170,022	0.1897	99.8103	0.9842
7.5	86,356,839	145,444	0.1684	99.8316	0.9823
8.5	81,098,964	155,757	0.1921	99.8079	0.9807
9.5	75,799,828	905,036	1.1940	98.8060	0.9788
10.5	70,115,602	593,712	0.8468	99.1532	0.9671
11.5	64,497,795	391,747	0.6074	99.3926	0.9589
12.5	58,290,904	380,569	0.6529	99.3471	0.9531
13.5	57,112,995	318,950	0.5585	99.4415	0.9469
14.5	52,837,890	424,306	0.8030	99.1970	0.9416
15.5	44,994,248	221,540	0.4924	99.5076	0.9340
16.5	43,089,905	168,820	0.3918	99.6082	0.9294
17.5	38,321,799	346,197	0.9034	99.0966	0.9258
18.5	34,695,001	117,579	0.3389	99.6611	0.9174
19.5	32,771,727	99,042	0.3022	99.6978	0.9143
20.5	31,070,653	190,374	0.6127	99.3873	0.9115
21.5	28,547,574	134,211	0.4701	99.5299	0.9060
22.5	26,989,384	212,370	0.7869	99.2131	0.9017
23.5	25,487,143	156,301	0.6133	99.3867	0.8946
24.5	22,593,579	100,847	0.4464	99.5536	0.8891
25.5	20,371,296	85,858	0.4215	99.5785	0.8852
26.5	16,470,274	118,610	0.7201	99.2799	0.8814
27.5	15,026,380	111,190	0.7400	99.2600	0.8751
28.5	13,306,338	61,141	0.4595	99.5405	0.8686
29.5	12,227,661	71,726	0.5866	99.4134	0.8646
30.5	10,608,450	87,312	0.8230	99.1770	0.8595
31.5	9,968,964	61,713	0.6190	99.3810	0.8525
32.5	8,935,326	66,503	0.7443	99.2557	0.8472
33.5	8,079,270	61,789	0.7648	99.2352	0.8409
34.5	7,435,913	77,228	1.0386	98.9614	0.8345
35.5	6,800,744	90,551	1.3315	98.6685	0.8258
36.5	6,143,566	150,127	2.4437	97.5563	0.8148
37.5	5,107,186	50,150	0.9819	99.0181	0.7949
38.5	4,322,536	46,548	1.0769	98.9231	0.7871

39.5	4,110,876	46,291	1.1261	98.8739	0.7786
40.5	3,712,000	42,146	1.1354	98.8646	0.7698
41.5	3,349,173	43,406	1.2960	98.7040	0.7611
42.5	3,232,625	41,172	1.2736	98.7264	0.7512
43.5	3,133,161	46,663	1.4893	98.5107	0.7417
44.5	2,837,396	52,165	1.8385	98.1615	0.7306
45.5	2,682,460	61,348	2.2870	97.7130	0.7172
46.5	2,423,656	53,842	2.2215	97.7785	0.7008
47.5	2,286,549	45,947	2.0095	97.9905	0.6852
48.5	2,286,425	34,130	1.4927	98.5073	0.6714
49.5	2,133,855	69,351	3.2500	96.7500	0.6614
50.5	1,934,486	118,399	6.1205	93.8795	0.6399
51.5	1,715,136	95,580	5.5727	94.4273	0.6008
52.5	1,519,364	56,096	3.6921	96.3079	0.5673
53.5	1,378,162	22,358	1.6223	98.3777	0.5463
54.5	1,282,363	2,875	0.2242	99.7758	0.5375
55.5	1,205,102	237,076	19.6727	80.3273	0.5363
56.5	891,808	271,966	30.4960	69.5040	0.4308
57.5	561,612	36,749	6.5434	93.4566	0.2994
58.5	451,113	17,443	3.8667	96.1333	0.2798
59.5	397,119	2,035	0.5126	99.4874	0.2690
60.5	394,363	2,612	0.6622	99.3378	0.2676
61.5	392,057	3,051	0.7781	99.2219	0.2658
62.5	388,599	2,889	0.7435	99.2565	0.2638
63.5	385,462	4,182	1.0850	98.9150	0.2618
64.5	381,311	1,995	0.5232	99.4768	0.2590
65.5	379,381	897	0.2365	99.7635	0.2576
66.5	378,497	282,867	74.7344	25.2656	0.2570
67.5	95,670	75,235	78.6402	21.3598	0.0649
68.5	22,636	9,341	41.2639	58.7361	0.0139
69.5	13,296	1,800	13.5360	86.4640	0.0081
70.5	11,496	1,798	15.6434	84.3566	0.0070
71.5	9,698	347	3.5820	96.4180	0.0059
72.5	9,350	205	2.1955	97.8045	0.0057
73.5	9,145	90	0.9789	99.0211	0.0056
74.5	9,055	84	0.9293	99.0707	0.0055
75.5	8,971	170	1.8964	98.1036	0.0055
76.5	8,801	187	2.1293	97.8707	0.0054
77.5	8,614	61	0.7125	99.2875	0.0053
78.5	8,552	145	1.6952	98.3048	0.0052
79.5	8,407	196	2.3290	97.6710	0.0052
80.5	8,212	191	2.3254	97.6746	0.0050
81.5	8,021	2,529	31.5319	68.4681	0.0049
82.5	5,492	2,562	46.6615	53.3385	0.0034
83.5	2,929	132	4.5133	95.4867	0.0018
84.5	2,797	154	5.5060	94.4940	0.0017
85.5	2,643	174	6.5995	93.4005	0.0016

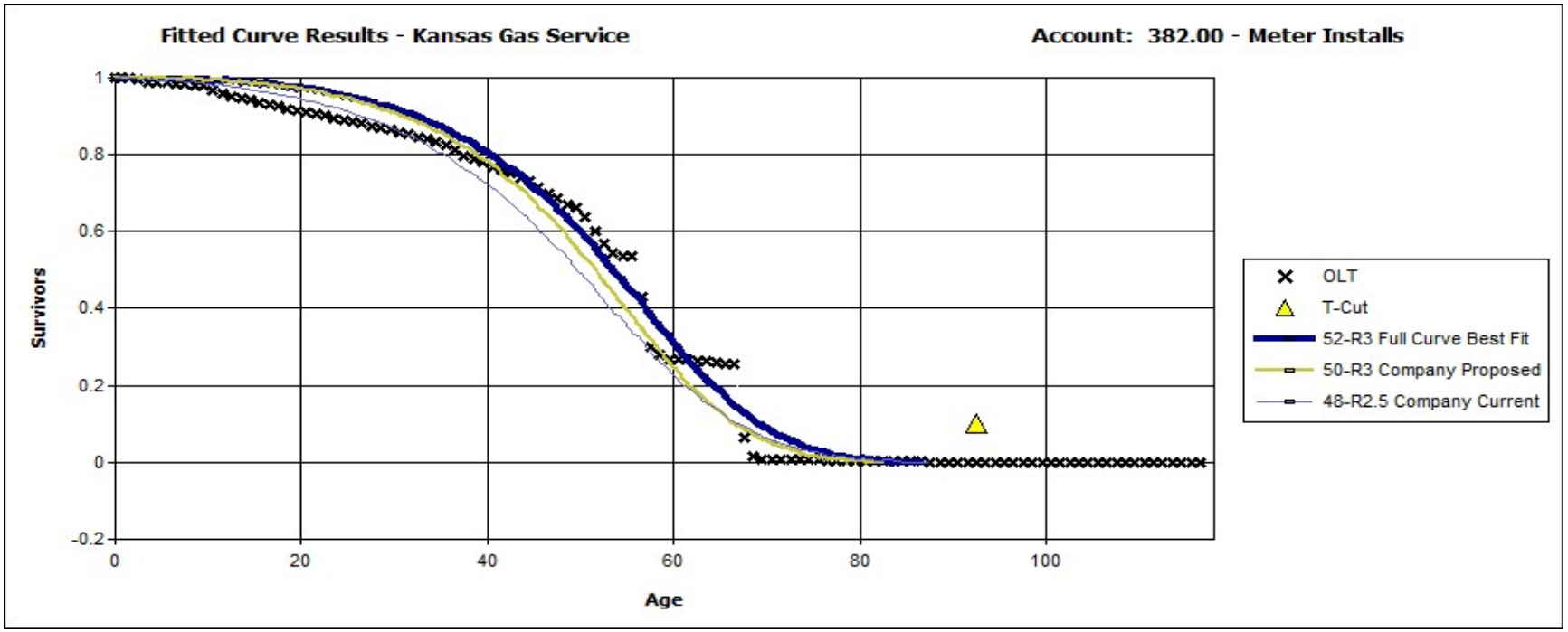
86.5	2,469	346	14.0259	85.9741	0.0015
87.5	2,122	1,967	92.7036	7.2964	0.0013
88.5	155	18	11.6435	88.3565	0.0001
89.5	137	0	0.0000	100.0000	0.0001
90.5	137	9	6.8484	93.1516	0.0001
91.5	127	85	66.7085	33.2915	0.0001
92.5	42	42	100.0000	0.0000	0.0000
93.5	0	0	0.0000	100.0000	0.0000
94.5	0	0	0.0000	100.0000	0.0000
95.5	0	0	0.0000	100.0000	0.0000
96.5	0	0	0.0000	100.0000	0.0000
97.5	0	0	0.0000	100.0000	0.0000
98.5	0	0	0.0000	100.0000	0.0000
99.5	0	0	0.0000	100.0000	0.0000
100.5	0	0	0.0000	100.0000	0.0000
101.5	0	0	0.0000	100.0000	0.0000
102.5	0	0	0.0000	100.0000	0.0000
103.5	0	0	0.0000	100.0000	0.0000
104.5	0	0	0.0000	100.0000	0.0000
105.5	0	0	0.0000	100.0000	0.0000
106.5	0	0	0.0000	100.0000	0.0000
107.5	0	0	0.0000	100.0000	0.0000
108.5	0	0	0.0000	100.0000	0.0000
109.5	0	0	0.0000	100.0000	0.0000
110.5	0	0	0.0000	100.0000	0.0000
111.5	0	0	0.0000	100.0000	0.0000
112.5	0	0	0.0000	100.0000	0.0000
113.5	0	0	0.0000	100.0000	0.0000
114.5	0	0	0.0000	100.0000	0.0000
115.5	0	0	0.0000	100.0000	0.0000
116.5	0	0	0.0000	100.0000	0.0000

Best Fit Curve Results
Kansas Gas Service
Account: 382.00 - Meter Installs

Curve	Life	Sum of Squared Differences
BAND	**1900 - 2017**	
R3	52.0	1,858.567
R2.5	51.0	1,899.129
R2	50.0	2,860.941
S2	52.0	3,344.325
S3	53.0	3,427.534
R4	53.0	3,885.861
S1.5	51.0	4,119.814
L4	54.0	4,773.304
R1.5	49.0	4,868.252
S1	50.0	5,617.840
L3	53.0	5,700.087
S4	54.0	6,172.767
S0.5	50.0	7,640.840
L5	54.0	7,803.375
R1	48.0	7,817.710
L2	52.0	9,080.363
R5	54.0	9,266.345
S0	49.0	10,391.128
S5	54.0	11,077.664
L1.5	52.0	11,246.783
R0.5	47.0	12,987.168
L1	51.0	14,262.320
S-0.5	48.0	14,574.283
S6	55.0	16,936.247
L0.5	51.0	17,638.604
O1	46.0	19,599.689
L0	51.0	21,795.723
O2	52.0	24,250.265
SQ	56.0	32,322.840
O3	65.0	38,893.310
O4	85.0	45,411.482

Analytical Parameters

OLT Placement Band:	1900 - 2017
OLT Experience Band:	1900 - 2017
Minimum Life Parameter	1
Maximum Life Paramete	100
Life Increment Paramete	1
Max Age (T-Cut):	92.5



Analytical Parameters

OLT Placement Band:	1900 - 2017
OLT Experience Band:	1900 - 2017
Minimum Life Parameter:	1
Maximum Life Parameter:	100
Life Increment Parameter:	1
Max Age (T-Cut):	94.0

KGS 2017

382.00 -

Calculation of Remaining Life
Based Upon Broad Group/Vintage Group Procedures
Related to Original Cost as of December 31, 2017

Survivor Curve .. IOWA: 52 R3

			BG/VG Average			
		Surviving	Service	Remaining	ASL	RL
Year	Age	Investment	Life	Life	Weights	Weights
(1)	(2)	(3)	(4)	(5)	(6)=(3)/(4)	(7)=(6)*(5)
2017	0.5	1,548,514	52.00	51.51	29,779	1,533,820
2016	1.5	891,689	52.00	50.52	17,148	866,373
2015	2.5	625,173	52.00	49.54	12,023	595,638
2014	3.5	1,438,288	52.00	48.57	27,659	1,343,304
2013	4.5	1,433,244	52.00	47.59	27,562	1,311,734
2012	5.5	1,683,857	52.00	46.62	32,382	1,509,657
2011	6.5	1,324,990	52.00	45.65	25,481	1,163,266
2010	7.5	3,246,907	52.00	44.69	62,441	2,790,441
2009	8.5	5,223,811	52.00	43.73	100,458	4,393,069
2008	9.5	5,257,065	52.00	42.78	101,097	4,324,532
2007	10.5	4,860,523	52.00	41.83	93,472	3,909,568
2006	11.5	5,137,643	52.00	40.88	98,801	4,039,165
2005	12.5	5,938,614	52.00	39.94	114,204	4,561,667
2004	13.5	944,051	52.00	39.01	18,155	708,225
2003	14.5	4,075,511	52.00	38.08	78,375	2,984,824
2002	15.5	7,537,026	52.00	37.16	144,943	5,386,629
2001	16.5	1,755,756	52.00	36.25	33,765	1,223,990
2000	17.5	4,741,523	52.00	35.34	91,183	3,222,855
1999	18.5	3,415,955	52.00	34.45	65,691	2,262,834
1998	19.5	1,886,673	52.00	33.56	36,282	1,217,473
1997	20.5	1,629,461	52.00	32.67	31,336	1,023,833
1996	21.5	2,331,205	52.00	31.80	44,831	1,425,551
1995	22.5	1,416,557	52.00	30.93	27,241	842,646
1994	23.5	1,272,390	52.00	30.08	24,469	735,910
1993	24.5	2,735,888	52.00	29.23	52,613	1,537,716
1992	25.5	2,119,278	52.00	28.39	40,755	1,156,944
1991	26.5	3,816,386	52.00	27.56	73,392	2,022,522
1990	27.5	1,327,073	52.00	26.74	25,521	682,364
1989	28.5	1,610,061	52.00	25.93	30,963	802,784
1988	29.5	1,020,211	52.00	25.13	19,619	492,980

1987	30.5	1,550,212	52.00	24.34	29,812	725,529
1986	31.5	554,388	52.00	23.56	10,661	251,151
1985	32.5	973,250	52.00	22.79	18,716	426,513
1984	33.5	792,425	52.00	22.03	15,239	335,716
1983	34.5	581,728	52.00	21.28	11,187	238,097
1982	35.5	558,009	52.00	20.55	10,731	220,499
1981	36.5	566,170	52.00	19.82	10,888	215,848
1980	37.5	887,840	52.00	19.11	17,074	326,342
1979	38.5	739,579	52.00	18.42	14,223	261,915
1978	39.5	164,332	52.00	17.73	3,160	56,032
1977	40.5	356,937	52.00	17.06	6,864	117,100
1976	41.5	320,885	52.00	16.40	6,171	101,221
1975	42.5	74,765	52.00	15.76	1,438	22,661
1974	43.5	64,541	52.00	15.13	1,241	18,785
1973	44.5	249,774	52.00	14.52	4,803	69,766
1972	45.5	173,048	52.00	13.93	3,328	46,358
1971	46.5	197,606	52.00	13.35	3,800	50,743
1970	47.5	97,799	52.00	12.79	1,881	24,060
1969	48.5	238,372	52.00	12.25	4,584	56,157
1968	49.5	117,931	52.00	11.73	2,268	26,593
1967	50.5	129,638	52.00	11.22	2,493	27,971
1966	51.5	101,186	52.00	10.73	1,946	20,883
1965	52.5	100,404	52.00	10.26	1,931	19,815
1964	53.5	84,960	52.00	9.81	1,634	16,030
1963	54.5	73,358	52.00	9.38	1,411	13,231
1962	55.5	72,985	52.00	8.96	1,404	12,580
1961	56.5	76,285	52.00	8.57	1,467	12,566
1960	57.5	57,714	52.00	8.18	1,110	9,084
1959	58.5	78,727	52.00	7.82	1,514	11,839
1958	59.5	36,667	52.00	7.47	705	5,268
1957	60.5	0	52.00	7.14	0	0
1956	61.5	0	52.00	6.82	0	0
1955	62.5	0	52.00	6.51	0	0
1954	63.5	0	52.00	6.21	0	0
1953	64.5	0	52.00	5.92	0	0
1952	65.5	0	52.00	5.64	0	0
1951	66.5	0	52.00	5.37	0	0
1950	67.5	0	52.00	5.10	0	0
1949	68.5	0	52.00	4.84	0	0
1948	69.5	0	52.00	4.58	0	0
1947	70.5	0	52.00	4.32	0	0
1946	71.5	0	52.00	4.07	0	0
1945	72.5	0	52.00	3.81	0	0
1944	73.5	0	52.00	3.55	0	0
1943	74.5	0	52.00	3.30	0	0
1942	75.5	0	52.00	3.04	0	0
1941	76.5	0	52.00	2.79	0	0

1940	77.5	0	52.00	2.54	0	0
1939	78.5	0	52.00	2.29	0	0
1938	79.5	0	52.00	2.04	0	0
1937	80.5	0	52.00	1.80	0	0
1936	81.5	0	52.00	1.56	0	0
1935	82.5	0	52.00	1.33	0	0
1934	83.5	0	52.00	1.10	0	0
1933	84.5	0	52.00	0.89	0	0
1932	85.5	0	52.00	0.69	0	0
1931	86.5	0	52.00	0.52	0	0
1930	87.5	0	52.00	0.50	0	0
1929	88.5	0	52.00	0.50	0	0
1928	89.5	0	52.00	0.50	0	0
1927	90.5	0	52.00	0.50	0	0
1926	91.5	0	52.00	0.50	0	0
1925	92.5	0	52.00	0.50	0	0
1924	93.5	0	52.00	0.50	0	0
1923	94.5	0	52.00	0.50	0	0
1922	95.5	0	52.00	0.50	0	0
1921	96.5	0	52.00	0.50	0	0
1920	97.5	0	52.00	0.50	0	0
1919	98.5	0	52.00	0.50	0	0
1918	99.5	0	52.00	0.50	0	0
1917	100.5	0	52.00	0.50	0	0
1916	101.5	0	52.00	0.50	0	0
1915	102.5	0	52.00	0.50	0	0
1914	103.5	0	52.00	0.50	0	0
1913	104.5	0	52.00	0.50	0	0
1912	105.5	0	52.00	0.50	0	0
1911	106.5	0	52.00	0.50	0	0
1910	107.5	0	52.00	0.50	0	0
1909	108.5	0	52.00	0.50	0	0
1908	109.5	0	52.00	0.50	0	0
1907	110.5	0	52.00	0.50	0	0
1906	111.5	0	52.00	0.50	0	0
1905	112.5	0	52.00	0.50	0	0
1904	113.5	0	52.00	0.50	0	0
1903	114.5	0	52.00	0.50	0	0
1902	115.5	0	52.00	0.50	0	0
1901	116.5	0	52.00	0.50	0	0
1900	117.5	0	52.00	0.50	0	0
		92,316,838			1,775,324	63,812,669

AVERAGE SERVICE LIFE	52.00
AVERAGE REMAINING LIFE	35.94

Observed Life Table Results
Kansas Gas Service
Account: 383.00 - House Regulators

Age	Exposures	Retirements	Retirement Ratio (%)	Survivor Ratio (%)	Cumulative Survivors
BAND		1900 - 2017			
0	23,953,314	1,262	0.0053	99.9947	1.0000
0.5	22,983,963	210,966	0.9179	99.0821	0.9999
1.5	20,456,410	115,433	0.5643	99.4357	0.9908
2.5	16,177,798	154,485	0.9549	99.0451	0.9852
3.5	15,906,994	223,888	1.4075	98.5925	0.9758
4.5	15,053,666	86,827	0.5768	99.4232	0.9620
5.5	14,817,840	56,108	0.3787	99.6213	0.9565
6.5	14,411,643	94,180	0.6535	99.3465	0.9529
7.5	14,116,905	78,437	0.5556	99.4444	0.9466
8.5	13,710,073	74,026	0.5399	99.4601	0.9414
9.5	13,355,523	106,795	0.7996	99.2004	0.9363
10.5	13,115,350	411,454	3.1372	96.8628	0.9288
11.5	12,475,059	186,142	1.4921	98.5079	0.8997
12.5	12,064,259	25,025	0.2074	99.7926	0.8862
13.5	11,637,828	49,434	0.4248	99.5752	0.8844
14.5	11,760,005	148,439	1.2622	98.7378	0.8807
15.5	11,399,503	29,177	0.2560	99.7440	0.8695
16.5	11,175,577	26,893	0.2406	99.7594	0.8673
17.5	10,548,318	24,547	0.2327	99.7673	0.8652
18.5	9,961,731	13,393	0.1344	99.8656	0.8632
19.5	9,867,997	37,432	0.3793	99.6207	0.8620
20.5	9,608,984	33,906	0.3529	99.6471	0.8588
21.5	8,962,730	24,826	0.2770	99.7230	0.8557
22.5	8,665,947	13,852	0.1598	99.8402	0.8534
23.5	8,417,209	11,185	0.1329	99.8671	0.8520
24.5	7,876,678	13,684	0.1737	99.8263	0.8509
25.5	7,355,650	19,805	0.2692	99.7308	0.8494
26.5	6,756,479	12,148	0.1798	99.8202	0.8471
27.5	6,266,421	7,331	0.1170	99.8830	0.8456
28.5	5,810,810	10,322	0.1776	99.8224	0.8446
29.5	5,600,090	25,859	0.4618	99.5382	0.8431
30.5	5,313,381	12,768	0.2403	99.7597	0.8392
31.5	5,151,139	5,911	0.1147	99.8853	0.8372
32.5	4,886,208	36,627	0.7496	99.2504	0.8362
33.5	4,677,956	75,420	1.6122	98.3878	0.8300
34.5	4,451,725	44,294	0.9950	99.0050	0.8166
35.5	4,234,390	29,359	0.6934	99.3066	0.8085
36.5	4,049,599	40,781	1.0070	98.9930	0.8029
37.5	3,842,668	47,680	1.2408	98.7592	0.7948
38.5	3,601,778	26,486	0.7354	99.2646	0.7849

39.5	3,440,827	26,052	0.7571	99.2429	0.7791
40.5	3,282,638	35,269	1.0744	98.9256	0.7732
41.5	3,128,561	21,865	0.6989	99.3011	0.7649
42.5	3,022,741	10,862	0.3593	99.6407	0.7596
43.5	2,926,276	17,491	0.5977	99.4023	0.7569
44.5	2,791,266	16,929	0.6065	99.3935	0.7523
45.5	2,652,128	15,247	0.5749	99.4251	0.7478
46.5	2,447,587	12,047	0.4922	99.5078	0.7435
47.5	2,303,822	12,028	0.5221	99.4779	0.7398
48.5	2,160,113	23,569	1.0911	98.9089	0.7359
49.5	1,988,635	14,428	0.7255	99.2745	0.7279
50.5	1,848,340	12,518	0.6772	99.3228	0.7226
51.5	1,733,097	7,407	0.4274	99.5726	0.7177
52.5	1,646,172	3,529	0.2144	99.7856	0.7147
53.5	1,561,979	5,800	0.3713	99.6287	0.7131
54.5	1,482,203	26,922	1.8163	98.1837	0.7105
55.5	1,384,986	17,508	1.2641	98.7359	0.6976
56.5	1,288,730	32,566	2.5270	97.4730	0.6888
57.5	1,178,543	17,009	1.4432	98.5568	0.6714
58.5	1,049,270	10,426	0.9936	99.0064	0.6617
59.5	957,455	12,885	1.3457	98.6543	0.6551
60.5	859,511	14,730	1.7138	98.2862	0.6463
61.5	734,269	33,770	4.5991	95.4009	0.6352
62.5	555,684	63,712	11.4655	88.5345	0.6060
63.5	348,691	13,609	3.9029	96.0971	0.5365
64.5	200,399	77,915	38.8802	61.1198	0.5156
65.5	52,816	18,800	35.5948	64.4052	0.3151
66.5	34,016	8,556	25.1535	74.8465	0.2030
67.5	25,460	3,081	12.1027	87.8973	0.1519
68.5	22,989	6,367	27.6973	72.3027	0.1335
69.5	16,622	4,326	26.0238	73.9762	0.0965
70.5	12,296	2,758	22.4329	77.5671	0.0714
71.5	9,538	4,748	49.7841	50.2159	0.0554
72.5	4,789	2,712	56.6313	43.3687	0.0278
73.5	2,077	137	6.5913	93.4087	0.0121
74.5	1,940	370	19.0902	80.9098	0.0113
75.5	1,570	299	19.0742	80.9258	0.0091
76.5	1,270	137	10.7770	89.2230	0.0074
77.5	1,133	0	0.0000	100.0000	0.0066
78.5	1,133	212	18.6911	81.3089	0.0066
79.5	922	72	7.7993	92.2007	0.0054
80.5	850	172	20.2015	79.7985	0.0049
81.5	678	68	9.9914	90.0086	0.0039
82.5	610	0	0.0000	100.0000	0.0035
83.5	610	0	0.0000	100.0000	0.0035
84.5	610	0	0.0000	100.0000	0.0035
85.5	610	0	0.0000	100.0000	0.0035

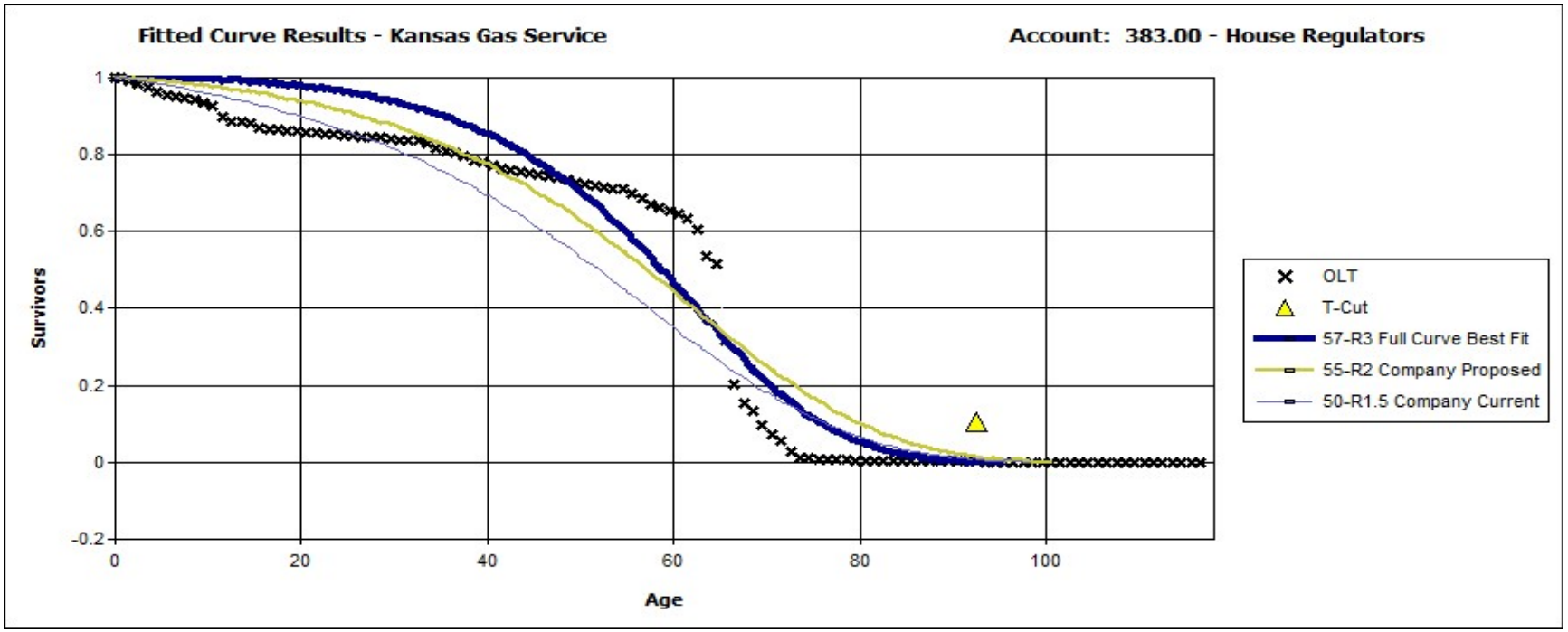
86.5	610	0	0.0000	100.0000	0.0035
87.5	610	0	0.0000	100.0000	0.0035
88.5	610	0	0.0000	100.0000	0.0035
89.5	610	0	0.0000	100.0000	0.0035
90.5	610	0	0.0000	100.0000	0.0035
91.5	610	36	5.9755	94.0245	0.0035
92.5	574	574	100.0000	0.0000	0.0033
93.5	0	0	0.0000	100.0000	0.0000
94.5	0	0	0.0000	100.0000	0.0000
95.5	0	0	0.0000	100.0000	0.0000
96.5	0	0	0.0000	100.0000	0.0000
97.5	0	0	0.0000	100.0000	0.0000
98.5	0	0	0.0000	100.0000	0.0000
99.5	0	0	0.0000	100.0000	0.0000
100.5	0	0	0.0000	100.0000	0.0000
101.5	0	0	0.0000	100.0000	0.0000
102.5	0	0	0.0000	100.0000	0.0000
103.5	0	0	0.0000	100.0000	0.0000
104.5	0	0	0.0000	100.0000	0.0000
105.5	0	0	0.0000	100.0000	0.0000
106.5	0	0	0.0000	100.0000	0.0000
107.5	0	0	0.0000	100.0000	0.0000
108.5	0	0	0.0000	100.0000	0.0000
109.5	0	0	0.0000	100.0000	0.0000
110.5	0	0	0.0000	100.0000	0.0000
111.5	0	0	0.0000	100.0000	0.0000
112.5	0	0	0.0000	100.0000	0.0000
113.5	0	0	0.0000	100.0000	0.0000
114.5	0	0	0.0000	100.0000	0.0000
115.5	0	0	0.0000	100.0000	0.0000
116.5	0	0	0.0000	100.0000	0.0000

Best Fit Curve Results
Kansas Gas Service
Account: 383.00 - House Regulators

Curve	Life	Sum of Squared Differences
BAND	**1900 - 2017**	
R3	57.0	8,087.046
R2.5	56.0	8,227.410
R2	55.0	9,187.793
R4	59.0	9,340.134
R1.5	54.0	10,968.921
S3	58.0	11,276.286
S2	57.0	11,419.155
S1.5	56.0	12,053.502
S4	60.0	12,805.247
L4	60.0	13,076.160
S1	55.0	13,362.404
R5	61.0	13,479.363
R1	53.0	13,707.961
L5	61.0	14,446.432
S0.5	55.0	14,997.141
L3	59.0	15,169.271
S5	61.0	15,736.066
S0	53.0	17,330.180
L2	58.0	17,891.178
R0.5	52.0	18,661.053
L1.5	57.0	19,272.577
S6	62.0	19,453.496
S-0.5	52.0	20,745.584
L1	56.0	21,531.774
L0.5	56.0	24,035.638
O1	50.0	25,190.904
L0	56.0	27,328.176
O2	58.0	28,588.304
SQ	64.0	32,188.796
O3	74.0	40,755.954
O4	98.0	45,678.012

Analytical Parameters

OLT Placement Band:	1900 - 2017
OLT Experience Band:	1900 - 2017
Minimum Life Parameter:	1
Maximum Life Parameter:	100
Life Increment Parameter:	1
Max Age (T-Cut):	92.5



Analytical Parameters

OLT Placement Band:	1900 - 2017
OLT Experience Band:	1900 - 2017
Minimum Life Parameter:	1
Maximum Life Parameter:	100
Life Increment Parameter:	1
Max Age (T-Cut):	94.0

KGS 2017

383.00 -

Calculation of Remaining Life
Based Upon Broad Group/Vintage Group Procedures
Related to Original Cost as of December 31, 2017

Survivor Curve .. IOWA: 57 R3

			BG/VG Average			
		Surviving	Service	Remaining	ASL	RL
Year	Age	Investment	Life	Life	Weights	Weights
(1)	(2)	(3)	(4)	(5)	(6)=(3)/(4)	(7)=(6)*(5)
2017	0.5	1,269,538	57.00	56.51	22,273	1,258,545
2016	1.5	2,587,599	57.00	55.52	45,396	2,520,566
2015	2.5	4,341,513	57.00	54.54	76,167	4,154,342
2014	3.5	273,084	57.00	53.56	4,791	256,624
2013	4.5	762,828	57.00	52.59	13,383	703,791
2012	5.5	243,316	57.00	51.62	4,269	220,334
2011	6.5	442,721	57.00	50.65	7,767	393,376
2010	7.5	304,628	57.00	49.68	5,344	265,512
2009	8.5	425,337	57.00	48.72	7,462	363,541
2008	9.5	406,889	57.00	47.76	7,138	340,934
2007	10.5	240,313	57.00	46.81	4,216	197,337
2006	11.5	375,579	57.00	45.86	6,589	302,157
2005	12.5	363,457	57.00	44.91	6,376	286,381
2004	13.5	595,669	57.00	43.97	10,450	459,532
2003	14.5	952	57.00	43.04	17	719
2002	15.5	392,106	57.00	42.11	6,879	289,678
2001	16.5	308,843	57.00	41.19	5,418	223,166
2000	17.5	736,889	57.00	40.27	12,928	520,619
1999	18.5	663,832	57.00	39.36	11,646	458,404
1998	19.5	113,735	57.00	38.46	1,995	76,736
1997	20.5	236,295	57.00	37.56	4,146	155,708
1996	21.5	615,476	57.00	36.67	10,798	395,970
1995	22.5	276,130	57.00	35.79	4,844	173,377
1994	23.5	239,578	57.00	34.91	4,203	146,750
1993	24.5	530,661	57.00	34.05	9,310	316,974
1992	25.5	509,517	57.00	33.19	8,939	296,670
1991	26.5	583,210	57.00	32.34	10,232	330,874
1990	27.5	486,362	57.00	31.50	8,533	268,739
1989	28.5	452,446	57.00	30.66	7,938	243,375
1988	29.5	210,947	57.00	29.84	3,701	110,417

1987	30.5	268,796	57.00	29.02	4,716	136,847
1986	31.5	160,070	57.00	28.21	2,808	79,225
1985	32.5	259,608	57.00	27.41	4,555	124,852
1984	33.5	171,100	57.00	26.62	3,002	79,919
1983	34.5	166,886	57.00	25.84	2,928	75,668
1982	35.5	172,573	57.00	25.07	3,028	75,916
1981	36.5	155,358	57.00	24.31	2,726	66,271
1980	37.5	166,834	57.00	23.57	2,927	68,973
1979	38.5	196,464	57.00	22.83	3,447	78,675
1978	39.5	138,276	57.00	22.10	2,426	53,607
1977	40.5	133,756	57.00	21.38	2,347	50,170
1976	41.5	117,060	57.00	20.67	2,054	42,459
1975	42.5	83,211	57.00	19.98	1,460	29,169
1974	43.5	147,423	57.00	19.30	2,586	49,914
1973	44.5	151,039	57.00	18.63	2,650	49,365
1972	45.5	133,365	57.00	17.97	2,340	42,054
1971	46.5	188,682	57.00	17.33	3,310	57,371
1970	47.5	131,039	57.00	16.70	2,299	38,399
1969	48.5	157,388	57.00	16.09	2,761	44,424
1968	49.5	147,595	57.00	15.49	2,589	40,109
1967	50.5	125,026	57.00	14.91	2,193	32,695
1966	51.5	102,384	57.00	14.34	1,796	25,754
1965	52.5	79,434	57.00	13.78	1,394	19,210
1964	53.5	80,665	57.00	13.25	1,415	18,749
1963	54.5	73,979	57.00	12.73	1,298	16,521
1962	55.5	70,185	57.00	12.23	1,231	15,055
1961	56.5	78,748	57.00	11.74	1,382	16,220
1960	57.5	77,621	57.00	11.27	1,362	15,348
1959	58.5	112,264	57.00	10.82	1,970	21,307
1958	59.5	81,390	57.00	10.38	1,428	14,824
1957	60.5	85,059	57.00	9.96	1,492	14,865
1956	61.5	110,512	57.00	9.56	1,939	18,531
1955	62.5	144,815	57.00	9.17	2,541	23,297
1954	63.5	143,281	57.00	8.80	2,514	22,112
1953	64.5	134,684	57.00	8.44	2,363	19,938
1952	65.5	69,735	57.00	8.09	1,223	9,902
1951	66.5	0	57.00	7.76	0	0
1950	67.5	0	57.00	7.44	0	0
1949	68.5	0	57.00	7.13	0	0
1948	69.5	0	57.00	6.84	0	0
1947	70.5	0	57.00	6.55	0	0
1946	71.5	0	57.00	6.26	0	0
1945	72.5	0	57.00	5.99	0	0
1944	73.5	0	57.00	5.72	0	0
1943	74.5	0	57.00	5.46	0	0
1942	75.5	0	57.00	5.20	0	0
1941	76.5	0	57.00	4.94	0	0

1940	77.5	0	57.00	4.68	0	0
1939	78.5	0	57.00	4.42	0	0
1938	79.5	0	57.00	4.16	0	0
1937	80.5	0	57.00	3.91	0	0
1936	81.5	0	57.00	3.66	0	0
1935	82.5	0	57.00	3.40	0	0
1934	83.5	0	57.00	3.14	0	0
1933	84.5	0	57.00	2.89	0	0
1932	85.5	0	57.00	2.64	0	0
1931	86.5	0	57.00	2.39	0	0
1930	87.5	0	57.00	2.14	0	0
1929	88.5	0	57.00	1.89	0	0
1928	89.5	0	57.00	1.66	0	0
1927	90.5	0	57.00	1.43	0	0
1926	91.5	0	57.00	1.20	0	0
1925	92.5	0	57.00	0.98	0	0
1924	93.5	0	57.00	0.79	0	0
1923	94.5	0	57.00	0.61	0	0
1922	95.5	0	57.00	0.50	0	0
1921	96.5	0	57.00	0.50	0	0
1920	97.5	0	57.00	0.50	0	0
1919	98.5	0	57.00	0.50	0	0
1918	99.5	0	57.00	0.50	0	0
1917	100.5	0	57.00	0.50	0	0
1916	101.5	0	57.00	0.50	0	0
1915	102.5	0	57.00	0.50	0	0
1914	103.5	0	57.00	0.50	0	0
1913	104.5	0	57.00	0.50	0	0
1912	105.5	0	57.00	0.50	0	0
1911	106.5	0	57.00	0.50	0	0
1910	107.5	0	57.00	0.50	0	0
1909	108.5	0	57.00	0.50	0	0
1908	109.5	0	57.00	0.50	0	0
1907	110.5	0	57.00	0.50	0	0
1906	111.5	0	57.00	0.50	0	0
1905	112.5	0	57.00	0.50	0	0
1904	113.5	0	57.00	0.50	0	0
1903	114.5	0	57.00	0.50	0	0
1902	115.5	0	57.00	0.50	0	0
1901	116.5	0	57.00	0.50	0	0
1900	117.5	0	57.00	0.50	0	0
		23,805,753			417,645	17,318,860

AVERAGE SERVICE LIFE	57.00
AVERAGE REMAINING LIFE	41.47

KGS 2017

390.10 -

Calculation of Remaining Life
Based Upon Broad Group/Vintage Group Procedures
Related to Original Cost as of December 31, 2017

Survivor Curve .. IOWA: 60 R1.5

			BG/VG Average			
		Surviving	Service	Remaining	ASL	RL
Year	Age	Investment	Life	Life	Weights	Weights
(1)	(2)	(3)	(4)	(5)	(6)=(3)/(4)	(7)=(6)*(5)
2017	0.5	882,933	60.00	59.59	14,716	876,849
2016	1.5	57,517	60.00	58.77	959	56,333
2015	2.5	673,112	60.00	57.95	11,219	650,086
2014	3.5	156,961	60.00	57.13	2,616	149,462
2013	4.5	931,488	60.00	56.32	15,525	874,415
2012	5.5	951,702	60.00	55.52	15,862	880,604
2011	6.5	1,583,516	60.00	54.72	26,392	1,444,044
2010	7.5	1,826,008	60.00	53.92	30,433	1,640,885
2009	8.5	738,495	60.00	53.12	12,308	653,845
2008	9.5	1,330,141	60.00	52.33	22,169	1,160,148
2007	10.5	1,198,140	60.00	51.55	19,969	1,029,311
2006	11.5	1,239,575	60.00	50.76	20,660	1,048,734
2005	12.5	2,365,836	60.00	49.98	39,431	1,970,890
2004	13.5	810,976	60.00	49.21	13,516	665,123
2003	14.5	773,166	60.00	48.44	12,886	624,178
2002	15.5	1,126,642	60.00	47.67	18,777	895,139
2001	16.5	544,803	60.00	46.91	9,080	425,930
2000	17.5	448,903	60.00	46.15	7,482	345,277
1999	18.5	636,789	60.00	45.39	10,613	481,778
1998	19.5	2,493,644	60.00	44.64	41,561	1,855,431
1997	20.5	0	60.00	43.90	0	0
1996	21.5	100,673	60.00	43.15	1,678	72,408
1995	22.5	1,560,495	60.00	42.42	26,008	1,103,196
1994	23.5	397,270	60.00	41.68	6,621	275,994
1993	24.5	490,788	60.00	40.96	8,180	335,004
1992	25.5	144,936	60.00	40.23	2,416	97,183
1991	26.5	174,457	60.00	39.51	2,908	114,887
1990	27.5	262,938	60.00	38.80	4,382	170,028
1989	28.5	2,894,543	60.00	38.09	48,242	1,837,577
1988	29.5	236,460	60.00	37.39	3,941	147,343

1987	30.5	120,261	60.00	36.69	2,004	73,540
1986	31.5	154,619	60.00	36.00	2,577	92,768
1985	32.5	1,741,355	60.00	35.31	29,023	1,024,860
1984	33.5	24,184	60.00	34.63	403	13,960
1983	34.5	465,865	60.00	33.96	7,764	263,676
1982	35.5	408,947	60.00	33.29	6,816	226,912
1981	36.5	59,159	60.00	32.63	986	32,174
1980	37.5	32,202	60.00	31.98	537	17,163
1979	38.5	164,421	60.00	31.33	2,740	85,856
1978	39.5	22,268	60.00	30.69	371	11,390
1977	40.5	10,522	60.00	30.06	175	5,271
1976	41.5	659,331	60.00	29.43	10,989	323,409
1975	42.5	13,563	60.00	28.81	226	6,513
1974	43.5	4,535,582	60.00	28.20	75,593	2,131,795
1973	44.5	7,930	60.00	27.60	132	3,647
1972	45.5	158,339	60.00	27.00	2,639	71,256
1971	46.5	2,614	60.00	26.41	44	1,151
1970	47.5	0	60.00	25.83	0	0
1969	48.5	168	60.00	25.26	3	71
1968	49.5	1,643	60.00	24.70	27	676
1967	50.5	27,177	60.00	24.14	453	10,935
1966	51.5	17,924	60.00	23.59	299	7,048
1965	52.5	412	60.00	23.06	7	158
1964	53.5	2,296	60.00	22.52	38	862
1963	54.5	1,514	60.00	22.00	25	555
1962	55.5	220	60.00	21.49	4	79
1961	56.5	0	60.00	20.99	0	0
1960	57.5	227,789	60.00	20.49	3,796	77,788
1959	58.5	1,512	60.00	20.00	25	504
1958	59.5	210,859	60.00	19.52	3,514	68,614
1957	60.5	334	60.00	19.05	6	106
1956	61.5	1,210	60.00	18.59	20	375
1955	62.5	0	60.00	18.14	0	0
1954	63.5	1,233	60.00	17.70	21	364
1953	64.5	19,161	60.00	17.26	319	5,513
1952	65.5	1,106	60.00	16.84	18	310
1951	66.5	434	60.00	16.42	7	119
1950	67.5	0	60.00	16.01	0	0
1949	68.5	0	60.00	15.61	0	0
1948	69.5	0	60.00	15.22	0	0
1947	70.5	65	60.00	14.83	1	16
1946	71.5	0	60.00	14.45	0	0
1945	72.5	606	60.00	14.08	10	142
1944	73.5	0	60.00	13.72	0	0
1943	74.5	0	60.00	13.36	0	0
1942	75.5	0	60.00	13.01	0	0
1941	76.5	733	60.00	12.67	12	155

1940	77.5	0	60.00	12.33	0	0
1939	78.5	0	60.00	12.00	0	0
1938	79.5	0	60.00	11.68	0	0
1937	80.5	0	60.00	11.36	0	0
1936	81.5	0	60.00	11.04	0	0
1935	82.5	0	60.00	10.73	0	0
1934	83.5	0	60.00	10.42	0	0
1933	84.5	0	60.00	10.12	0	0
1932	85.5	4,889	60.00	9.82	81	800
1931	86.5	2,579	60.00	9.53	43	409
1930	87.5	6,090	60.00	9.23	102	937
1929	88.5	10,636	60.00	8.95	177	1,586
1928	89.5	0	60.00	8.66	0	0
1927	90.5	0	60.00	8.38	0	0
1926	91.5	0	60.00	8.10	0	0
1925	92.5	0	60.00	7.83	0	0
1924	93.5	330	60.00	7.56	5	42
1923	94.5	0	60.00	7.29	0	0
1922	95.5	0	60.00	7.03	0	0
1921	96.5	0	60.00	6.78	0	0
1920	97.5	0	60.00	6.52	0	0
1919	98.5	0	60.00	6.28	0	0
1918	99.5	0	60.00	6.04	0	0
1917	100.5	0	60.00	5.80	0	0
1916	101.5	0	60.00	5.57	0	0
1915	102.5	0	60.00	5.35	0	0
1914	103.5	0	60.00	5.12	0	0
1913	104.5	0	60.00	4.90	0	0
1912	105.5	0	60.00	4.67	0	0
1911	106.5	0	60.00	4.44	0	0
1910	107.5	0	60.00	4.20	0	0
1909	108.5	0	60.00	3.94	0	0
1908	109.5	0	60.00	3.67	0	0
1907	110.5	0	60.00	3.37	0	0
1906	111.5	0	60.00	3.05	0	0
1905	112.5	0	60.00	2.71	0	0
1904	113.5	14,651	60.00	2.38	244	581
1903	114.5	0	60.00	2.04	0	0
1902	115.5	0	60.00	1.71	0	0
1901	116.5	0	60.00	1.39	0	0
1900	117.5	0	60.00	1.07	0	0
		36,169,639			602,827	26,446,171

AVERAGE SERVICE LIFE	60.00
AVERAGE REMAINING LIFE	43.87

KGS 2017

392.00 -

Calculation of Remaining Life
Based Upon Broad Group/Vintage Group Procedures
Related to Original Cost as of December 31, 2017

Survivor Curve .. IOWA: 15 L1.5

			BG/VG Average			
		Surviving	Service	Remaining	ASL	RL
Year	Age	Investment	Life	Life	Weights	Weights
(1)	(2)	(3)	(4)	(5)	(6)=(3)/(4)	(7)=(6)*(5)
2017	0.5	3,741,918	15.00	14.51	249,461	3,620,878
2016	1.5	3,359,771	15.00	13.57	223,985	3,040,204
2015	2.5	729,353	15.00	12.68	48,624	616,482
2014	3.5	2,434,566	15.00	11.84	162,304	1,921,734
2013	4.5	3,636,692	15.00	11.06	242,446	2,681,838
2012	5.5	3,432,801	15.00	10.34	228,853	2,366,945
2011	6.5	1,800,573	15.00	9.69	120,038	1,163,251
2010	7.5	1,641,215	15.00	9.12	109,414	997,366
2009	8.5	4,630,825	15.00	8.62	308,722	2,660,131
2008	9.5	931,154	15.00	8.18	62,077	507,909
2007	10.5	186,667	15.00	7.80	12,444	97,052
2006	11.5	195,671	15.00	7.46	13,045	97,277
2005	12.5	170,627	15.00	7.15	11,375	81,291
2004	13.5	668,986	15.00	6.86	44,599	305,814
2003	14.5	13,694	15.00	6.58	913	6,008
2002	15.5	0	15.00	6.31	0	0
2001	16.5	381,415	15.00	6.05	25,428	153,803
2000	17.5	7,708,472	15.00	5.79	513,898	2,973,739
1999	18.5	1,918,562	15.00	5.53	127,904	706,882
1998	19.5	18,275	15.00	5.27	1,218	6,420
1997	20.5	56,279	15.00	5.02	3,752	18,819
1996	21.5	294,356	15.00	4.77	19,624	93,558
1995	22.5	17,068	15.00	4.53	1,138	5,150
1994	23.5	214,835	15.00	4.29	14,322	61,453
1993	24.5	55,845	15.00	4.06	3,723	15,127
1992	25.5	36,005	15.00	3.84	2,400	9,226
1991	26.5	83,352	15.00	3.63	5,557	20,177
1990	27.5	54,244	15.00	3.43	3,616	12,388
1989	28.5	50,168	15.00	3.23	3,345	10,796
1988	29.5	1,871	15.00	3.04	125	379

1987	30.5	99	15.00	2.85	7	19
1986	31.5	7,913	15.00	2.67	528	1,410
1985	32.5	9,220	15.00	2.50	615	1,537
1984	33.5	0	15.00	2.33	0	0
1983	34.5	0	15.00	2.17	0	0
1982	35.5	0	15.00	2.02	0	0
1981	36.5	0	15.00	1.87	0	0
1980	37.5	0	15.00	1.72	0	0
1979	38.5	0	15.00	1.57	0	0
1978	39.5	0	15.00	1.41	0	0
1977	40.5	0	15.00	1.24	0	0
1976	41.5	0	15.00	1.06	0	0
1975	42.5	0	15.00	0.88	0	0
1974	43.5	0	15.00	0.67	0	0
1973	44.5	0	15.00	0.50	0	0
1972	45.5	0	15.00	0.50	0	0
1971	46.5	0	15.00	0.50	0	0
1970	47.5	0	15.00	0.50	0	0
1969	48.5	0	15.00	0.50	0	0
1968	49.5	0	15.00	0.50	0	0
1967	50.5	0	15.00	0.50	0	0
1966	51.5	0	15.00	0.50	0	0
1965	52.5	0	15.00	0.50	0	0
1964	53.5	0	15.00	0.50	0	0
1963	54.5	0	15.00	0.50	0	0
1962	55.5	0	15.00	0.50	0	0
1961	56.5	0	15.00	0.50	0	0
1960	57.5	0	15.00	0.50	0	0
1959	58.5	0	15.00	0.50	0	0
1958	59.5	0	15.00	0.50	0	0
1957	60.5	0	15.00	0.50	0	0
1956	61.5	0	15.00	0.50	0	0
1955	62.5	0	15.00	0.50	0	0
1954	63.5	0	15.00	0.50	0	0
1953	64.5	0	15.00	0.50	0	0
1952	65.5	0	15.00	0.50	0	0
1951	66.5	0	15.00	0.50	0	0
1950	67.5	0	15.00	0.50	0	0
1949	68.5	0	15.00	0.50	0	0
1948	69.5	0	15.00	0.50	0	0
1947	70.5	0	15.00	0.50	0	0
1946	71.5	0	15.00	0.50	0	0
1945	72.5	0	15.00	0.50	0	0
1944	73.5	0	15.00	0.50	0	0
1943	74.5	0	15.00	0.50	0	0
1942	75.5	0	15.00	0.50	0	0
1941	76.5	0	15.00	0.50	0	0

1940	77.5	0	15.00	0.50	0	0
1939	78.5	0	15.00	0.50	0	0
1938	79.5	0	15.00	0.50	0	0
1937	80.5	0	15.00	0.50	0	0
1936	81.5	0	15.00	0.50	0	0
1935	82.5	0	15.00	0.50	0	0
1934	83.5	0	15.00	0.50	0	0
1933	84.5	0	15.00	0.50	0	0
1932	85.5	0	15.00	0.50	0	0
1931	86.5	0	15.00	0.50	0	0
1930	87.5	0	15.00	0.50	0	0
1929	88.5	0	15.00	0.50	0	0
1928	89.5	0	15.00	0.50	0	0
1927	90.5	0	15.00	0.50	0	0
1926	91.5	0	15.00	0.50	0	0
1925	92.5	0	15.00	0.50	0	0
1924	93.5	0	15.00	0.50	0	0
1923	94.5	0	15.00	0.50	0	0
1922	95.5	0	15.00	0.50	0	0
1921	96.5	0	15.00	0.50	0	0
1920	97.5	0	15.00	0.50	0	0
		38,482,491			2,565,499	24,255,063

AVERAGE SERVICE LIFE	15.00
AVERAGE REMAINING LIFE	9.45

KGS 2017

393.00 -

Calculation of Remaining Life
Based Upon Broad Group/Vintage Group Procedures
Related to Original Cost as of December 31, 2017

Survivor Curve .. IOWA: 15 L1

			BG/VG Average			
		Surviving	Service	Remaining	ASL	RL
Year	Age	Investment	Life	Life	Weights	Weights
(1)	(2)	(3)	(4)	(5)	(6)=(3)/(4)	(7)=(6)*(5)
2017	0.5	0	15.00	14.53	0	0
2016	1.5	65,934	15.00	13.63	4,396	59,929
2015	2.5	0	15.00	12.80	0	0
2014	3.5	0	15.00	12.04	0	0
2013	4.5	0	15.00	11.35	0	0
2012	5.5	0	15.00	10.75	0	0
2011	6.5	40,338	15.00	10.21	2,689	27,470
2010	7.5	5,175	15.00	9.75	345	3,363
2009	8.5	29,241	15.00	9.33	1,949	18,187
2008	9.5	0	15.00	8.94	0	0
2007	10.5	0	15.00	8.56	0	0
2006	11.5	0	15.00	8.20	0	0
2005	12.5	0	15.00	7.85	0	0
2004	13.5	5,292	15.00	7.51	353	2,651
2003	14.5	0	15.00	7.19	0	0
2002	15.5	0	15.00	6.87	0	0
2001	16.5	0	15.00	6.57	0	0
2000	17.5	22,624	15.00	6.27	1,508	9,463
1999	18.5	2,201	15.00	5.99	147	879
1998	19.5	8,496	15.00	5.71	566	3,235
1997	20.5	0	15.00	5.44	0	0
1996	21.5	0	15.00	5.18	0	0
1995	22.5	0	15.00	4.93	0	0
1994	23.5	0	15.00	4.68	0	0
1993	24.5	0	15.00	4.44	0	0
1992	25.5	0	15.00	4.21	0	0
1991	26.5	0	15.00	3.98	0	0
1990	27.5	0	15.00	3.76	0	0
1989	28.5	0	15.00	3.55	0	0
1988	29.5	0	15.00	3.34	0	0

1987	30.5	0	15.00	3.13	0	0
1986	31.5	0	15.00	2.93	0	0
1985	32.5	0	15.00	2.73	0	0
1984	33.5	0	15.00	2.54	0	0
1983	34.5	0	15.00	2.35	0	0
1982	35.5	0	15.00	2.16	0	0
1981	36.5	0	15.00	1.98	0	0
1980	37.5	0	15.00	1.79	0	0
1979	38.5	0	15.00	1.61	0	0
1978	39.5	0	15.00	1.43	0	0
1977	40.5	0	15.00	1.25	0	0
1976	41.5	0	15.00	1.07	0	0
1975	42.5	0	15.00	0.88	0	0
1974	43.5	0	15.00	0.68	0	0
1973	44.5	0	15.00	0.50	0	0
1972	45.5	0	15.00	0.50	0	0
1971	46.5	0	15.00	0.50	0	0
1970	47.5	0	15.00	0.50	0	0
1969	48.5	0	15.00	0.50	0	0
1968	49.5	0	15.00	0.50	0	0
1967	50.5	0	15.00	0.50	0	0
1966	51.5	0	15.00	0.50	0	0
1965	52.5	0	15.00	0.50	0	0
1964	53.5	0	15.00	0.50	0	0
1963	54.5	0	15.00	0.50	0	0
1962	55.5	0	15.00	0.50	0	0
1961	56.5	0	15.00	0.50	0	0
1960	57.5	0	15.00	0.50	0	0
1959	58.5	0	15.00	0.50	0	0
1958	59.5	0	15.00	0.50	0	0
1957	60.5	0	15.00	0.50	0	0
1956	61.5	0	15.00	0.50	0	0
1955	62.5	0	15.00	0.50	0	0
1954	63.5	0	15.00	0.50	0	0
1953	64.5	0	15.00	0.50	0	0
1952	65.5	0	15.00	0.50	0	0
1951	66.5	0	15.00	0.50	0	0
1950	67.5	0	15.00	0.50	0	0
1949	68.5	0	15.00	0.50	0	0
1948	69.5	0	15.00	0.50	0	0
1947	70.5	0	15.00	0.50	0	0
1946	71.5	0	15.00	0.50	0	0
1945	72.5	0	15.00	0.50	0	0
1944	73.5	0	15.00	0.50	0	0
1943	74.5	0	15.00	0.50	0	0
1942	75.5	0	15.00	0.50	0	0
1941	76.5	0	15.00	0.50	0	0

1940	77.5	0	15.00	0.50	0	0
1939	78.5	0	15.00	0.50	0	0
1938	79.5	0	15.00	0.50	0	0
1937	80.5	0	15.00	0.50	0	0
1936	81.5	0	15.00	0.50	0	0
1935	82.5	0	15.00	0.50	0	0
1934	83.5	0	15.00	0.50	0	0
1933	84.5	0	15.00	0.50	0	0
1932	85.5	0	15.00	0.50	0	0
1931	86.5	0	15.00	0.50	0	0
1930	87.5	0	15.00	0.50	0	0
1929	88.5	0	15.00	0.50	0	0
		179,301			11,953	125,176

AVERAGE SERVICE LIFE	15.00
AVERAGE REMAINING LIFE	10.47

CERTIFICATE OF SERVICE

18-KGSG-560-RTS

I, the undersigned, hereby certify that a true and correct copy of the above and foregoing document was served by electronic service on this 29th day of October 2018, to the following:

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