Exhibit No.: 041
Issue: Depreciation
Witness: John J. Spanos
Sponsoring Party: Ameren Missouri
File No.: ER-2019-0335

MISSOURI PUBLIC SERVICE COMMISSION

FILE NO. ER-2019-0335

DIRECT TESTIMONY OF

JOHN J. SPANOS

ON BEHALF OF

AMEREN MISSOURI

Camp Hill, Pennsylvania

July, 2019

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I. INTRODUCTION AND PURPOSE

Q. PLEASE STATE YOUR NAME AND ADDRESS.

A. My name is John J. Spanos. My business address is 207 Senate Avenue, Camp Hill, Pennsylvania.

Q. ARE YOU ASSOCIATED WITH ANY FIRM?

A. Yes. I am associated with the firm of Gannett Fleming Valuation and Rate Consultants, LLC ("Gannett Fleming").

Q. HOW LONG HAVE YOU BEEN ASSOCIATED WITH GANNETT FLEMING?

A. I have been associated with the firm since college graduation in June, 1986.

Q. WHAT IS YOUR POSITION WITH THE FIRM?

A. I am President.

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

A. I am testifying on behalf of Ameren Missouri ("Ameren" or the "Company").

Q. PLEASE STATE YOUR QUALIFICATIONS.

A. I have 33 years of utility depreciation experience, which includes providing expert testimony in over 300 cases before approximately 40 regulatory commissions, including this Commission. These cases have included depreciation studies in the electric, gas, water, wastewater and pipeline industries. In addition to the cases where I have submitted testimony, I have supervised in over 600 other depreciation or valuation assignments. Please refer to Schedule JJS-D1 for my qualifications statement, which includes further information regarding my work history, case experience and leadership in the Society of Depreciation Professionals.

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

A. I sponsor the depreciation study performed for Ameren attached hereto as Schedule JJS-D2 ("Depreciation Study"). The study was conducted by me and by others working for me under my direction and control. The Depreciation Study sets forth the calculated annual depreciation accrual rates by account as of December 31, 2018. The proposed rates appropriately reflect the rates at which Ameren's assets should be depreciated over their useful lives and are based on the most commonly used methods and procedures for determining depreciation rates.

Q. CAN YOU SUMMARIZE THE IMPACT ON DEPRECIATION RATES BASED ON THE DEPRECIATION STUDY?

A. Yes. The table below sets forth a comparison of the current depreciation rates and resultant expense to the proposed depreciation rates and expense by function as of December 31, 2018.

	Current		Proposed	
Function	Rates	Proforma Expense	Rates	Expense
Steam	3.46	$157,453,361	4.23	$192,375,575
Nuclear	2.26	73,591,028	2.54	82,770,779
Hydraulic	2.26	11,352,723	2.56	12,849,916
Other	2.24	28,152,561	1.79	22,536,295
Transmission	2.64	32,182,201	2.45	29,820,800
Distribution	2.99	178,100,715	2.98	177,253,815
General	5.92	38,326,411	5.60	36,201,049
Total		$519,158,999		$553,808,229

I have also developed a recommendation for depreciation rates to be applied to wind generation and storage assets that I understand Ameren plans to own and operate starting in 2020.

Q. CAN YOU EXPLAIN SOME OF THE MAJOR FACTORS THAT CAUSED THE CHANGE IN DEPRECIATION RATES?

A. Yes. The major components that caused rates to change by function are as follows:

- Steam Production Plant: major capital investment with a shorter overall life span to recover the costs.
- Nuclear Plant: the utilization of shorter interim survivor curves for most accounts and major capital investment with a shorter overall life span to recover the costs.
- Other Production Plant: the utilization of longer survivor curves for a few accounts.

II. DEPRECIATION STUDY

Q. PLEASE DEFINE THE CONCEPT OF DEPRECIATION.

A. Depreciation refers to the loss in service value not restored by current maintenance, incurred in connection with the consumption or prospective retirement of utility plant in the course of service from causes which are known to be in current operation and against which the Company is not protected by insurance. Among the causes to be given consideration are wear and tear, decay, action of the elements, inadequacy, obsolescence, changes in the art, changes in demand and the requirements of public authorities.

Q. DID YOU PREPARE THE DEPRECIATION STUDY SUBMITTED BY AMEREN TO THE COMMISSION'S STAFF AND THE OFFICE OF THE

PUBLIC COUNSEL IN ACCORDANCE WITH THE COMMISSION'S RULES?

A. Yes. I prepared the depreciation study submitted by Ameren. My report which as noted is attached to this testimony as Schedule JJS-D2 is entitled: "2018 Depreciation Study - Calculated Annual Depreciation Accruals Related to Electric Plant as of December 31, 2018." This report sets forth the results of my depreciation study for Ameren.

Q. IN PREPARING THE DEPRECIATION STUDY, DID YOU FOLLOW GENERALLY ACCEPTED PRACTICES IN THE FIELD OF DEPRECIATION VALUATION?

A. Yes.

Q. ARE THE METHODS AND PROCEDURES OF THIS DEPRECIATION STUDY CONSISTENT WITH PAST PRACTICES?

A. The methods and procedures of this study are the same as those utilized in the last study for this company as well as others before this Commission. Depreciation rates are determined based on the average service life procedure and the remaining life method.

Q. PLEASE DESCRIBE THE CONTENTS OF YOUR REPORT.

A. My report is presented in nine parts. Part I, Introduction, presents the scope and basis for the depreciation study. Part II, Estimation of Survivor Curves, includes descriptions of the methodology of estimating survivor curves. Parts III and IV set forth the analysis for determining life and net salvage estimation. Part V, Calculation of Annual and Accrued Depreciation, includes the concepts of depreciation and amortization using the remaining life. Part VI, Results of Study, presents a description

of the results and a summary of the depreciation calculations. Parts VII, VIII and IX include graphs and tables that relate to the service life and net salvage analyses, and the detailed depreciation calculations.

The table on pages VI-4 through VI-7 presents the estimated survivor curve, the net salvage percent, the original cost as of December 31, 2018, the book depreciation reserve and the calculated annual depreciation accrual and rate for each account or subaccount. The section beginning on page VII-2 presents the results of the retirement rate analyses prepared as the historical bases for the service life estimates. The section beginning on page VIII-2 presents the results of the salvage analysis. The section beginning on page IX-2 presents the depreciation calculations related to surviving original cost as of December 31, 2018.

Q. PLEASE EXPLAIN HOW YOU PERFORMED YOUR DEPRECIATION STUDY.

A. I used the straight line remaining life method of depreciation, with the average service life procedure. The annual depreciation is based on a method of depreciation accounting that seeks to distribute the unrecovered cost of fixed capital assets over the estimated remaining useful life of each unit, or group of assets, in a systematic and reasonable manner.

For General Plant Accounts 391.0, 391.2, 391.3, 393, 394, 395, 397 and 398, I used the straight line remaining life method of amortization. Additionally, for certain general plant assets recorded in Generating Accounts 316.21, 316.22, 316.23, 325.21, 325.22, 325.23, 335.21, 335.22, 335.23, 346.21, 346.22 and 346.23, as well as training assets in General Plant Accounts 390.05, 392.05, 394.05 and 397.05, I use the straight line remaining life method of amortization. The account numbers

identified throughout my testimony represent those in effect as of December 31, 2018. The annual amortization is based on amortization accounting that distributes the unrecovered cost of fixed capital assets over the remaining amortization period selected for each account and vintage.

Q. HOW DID YOU DETERMINE THE RECOMMENDED ANNUAL DEPRECIATION ACCRUAL RATES?

A. I did this in two phases. In the first phase, I estimated the service life and net salvage characteristics for each depreciable group, that is, each plant account or subaccount identified as having similar characteristics. In the second phase, I calculated the composite remaining lives and annual depreciation accrual rates based on the service life and net salvage estimates determined in the first phase.

Q. PLEASE DESCRIBE THE FIRST PHASE OF THE DEPRECIATION STUDY, IN WHICH YOU ESTIMATED THE SERVICE LIFE AND NET SALVAGE CHARACTERISTICS FOR EACH DEPRECIABLE GROUP.

A. The service life and net salvage study consisted of compiling historical data from records related to Ameren's plant; analyzing these data to obtain historical trends of survivor characteristics; obtaining supplementary information from management and operating personnel concerning practices and plans as they relate to plant operations; and interpreting the above data and the estimates used by other electric utilities to form judgments of average service life and net salvage characteristics.

Q. WHAT HISTORICAL DATA DID YOU ANALYZE FOR THE PURPOSE OF ESTIMATING SERVICE LIFE CHARACTERISTICS?

A. Generally speaking, I analyzed the Company's accounting entries that record plant transactions during the period 1922 through 2018. The transactions included additions, retirements, transfers, sales and the related balances.

Q. WHAT METHOD DID YOU USE TO ANALYZE THESE SERVICE LIFE DATA?

A. I used the retirement rate method. This is the most appropriate method when retirement data covering a long period of time is available because this method determines the average rates of retirement actually experienced by the Company during the period of time covered by the depreciation study.

Q. PLEASE DESCRIBE HOW YOU USED THE RETIREMENT RATE METHOD TO ANALYZE AMEREN'S SERVICE LIFE DATA.

A. I applied the retirement rate analysis to each different group of property in the study. For each property group, I used the retirement rate data to form a life table which, when plotted, shows an original survivor curve for that property group. Each original survivor curve represents the average survivor pattern experienced by the several vintage groups during the experience band studied. The survivor patterns do not necessarily describe the life characteristics of the property group; therefore, interpretation of the original survivor curves is required in order to use them as valid considerations in estimating service life. The Iowa-type survivor curves were used to perform these interpretations.

Q. WHAT IS AN "IOWA-TYPE SURVIVOR CURVE" AND HOW DID YOU USE SUCH CURVES TO ESTIMATE THE SERVICE LIFE CHARACTERISTICS FOR EACH PROPERTY GROUP?

A. Iowa-type curves are a widely-used group of survivor curves that contain the range of survivor characteristics usually experienced by utilities and other industrial companies. The Iowa curves were developed at the Iowa State College Engineering Experiment Station through an extensive process of observing and classifying the ages at which various types of property used by utilities and other industrial companies had been retired.

Iowa-type curves are used to smooth and extrapolate original survivor curves determined by the retirement rate method. The Iowa curves and truncated Iowa curves were used in this study to describe the forecasted rates of retirement based on the observed rates of retirement and the outlook for future retirements.

The estimated survivor curve designations for each depreciable property group indicate the average service life, the family within the Iowa system to which the property group belongs, and the relative height of the mode. For example, the Iowa 50-R2.5 indicates an average service life of fifty years; a right-moded, or R, type curve (the mode occurs after average life for right-moded curves); and a moderate height, 2.5, for the mode (possible modes for R type curves range from 1 to 5).

Q. WHAT APPROACH DID YOU USE TO ESTIMATE THE LIVES OF SIGNIFICANT FACILITIES SUCH AS PRODUCTION PLANTS?

A. I used the life span technique to estimate the lives of significant facilities for which concurrent retirement of the entire facility is anticipated. In this technique, the survivor characteristics of such facilities are described by the use of interim survivor curves and estimated probable retirement dates.

The interim survivor curves describe the rate of retirement related to the replacement of elements of the facility, such as, for a building, the retirements of

plumbing, heating, doors, windows, roofs, etc., that occur during the life of the facility. The probable retirement date provides the rate of final retirement for each year of installation for the facility by truncating the interim survivor curve for each installation year at its attained age at the date of probable retirement. The use of interim survivor curves truncated at the date of probable retirement provides a consistent method for estimating the lives of the several years of installation for a particular facility inasmuch as a single concurrent retirement for all years of installation will occur when it is retired.

Q. HAS GANNETT FLEMING USED THIS APPROACH IN OTHER PROCEEDINGS?

A. Yes, we have used the life span technique in performing depreciation studies presented to and accepted by many public utility commissions across the United States and Canada, including Missouri. This technique is currently being utilized by Ameren in the same manner recommended in this case.

Q. WHAT ARE THE BASES FOR THE PROBABLE RETIREMENT YEARS THAT YOU HAVE ESTIMATED FOR EACH FACILITY?

A. The probable retirement years are life spans for each facility that are based on judgment and a Black and Veatch comprehensive study performed a few years ago, as well as consideration of the age, use, size, nature of construction, management outlook and typical life spans experienced and used by other electric utilities for similar facilities. Most of the life spans result in probable retirement dates that are many years in the future with the exception of Ameren's Meramec Energy Center, which will be retired in 2022 as previously announced by the Company. As a result, the retirements of the facilities other than Meramec are not yet subject to specific

management plans. Such plans would be premature. At the appropriate time, detailed studies of the economics of rehabilitation and continued use or retirement of the structure will be performed and the results incorporated in the estimation of the facility's life span.

Q. ARE THERE SOME GENERATING UNITS FOR WHICH A SHORTER LIFE SPAN COULD BE CONSIDERED?

A. Yes. In my opinion, given the environmental regulations for coal-fired facilities across the United States, it is very likely the currently estimated retirement dates of coal-fired generating units will be modified in the short or intermediate term by moving those probable retirement dates up. Recent experience in the industry has seen the retirement of many coal-fired plants built in the 1950s and 1960s. I expect that those built in the 1970s and 1980s will have life spans less than 55 years and in many cases, based on current equipment and regulations, a life span less than 50 years is planned. In my opinion, a combination of these factors may mean that Ameren's other coal-fired plants will not stay in service until their currently-estimated retirement dates.

Q. DID YOU PHYSICALLY OBSERVE AMEREN MISSOURI'S PLANT AND EQUIPMENT AS PART OF YOUR DEPRECIATION STUDY?

A. Yes. I made a field review of Ameren's property as part of this study during April 2019 and previously conducted field visits in March 2014 to observe representative portions of plant. Field reviews are conducted to become familiar with Company operations and to obtain an understanding of the function of the plant and information with respect to the reasons for past retirements and the expected future causes of retirements. This knowledge, as well as information from other discussions with

management, was incorporated in the interpretation and extrapolation of the statistical analyses.

Q. WOULD YOU EXPLAIN THE CONCEPT OF "NET SALVAGE"?

A. Net salvage is a component of the service value of capital assets that is reflected in depreciation rates. The service value of an asset is its original cost less its net salvage. Net salvage is the salvage value received for the asset upon retirement less the cost to retire the asset. When the cost to retire exceeds the salvage value, the result is negative net salvage.

Inasmuch as depreciation expense is the loss in service value of an asset during a defined period, e.g. one year, it must include a ratable portion of both the original cost and the net salvage. That is, the net salvage related to an asset should be incorporated in the cost of service during the same period as its original cost so that customers receiving service from the asset pay rates that include a portion of both elements of the asset's service value, the original cost and the net salvage value.

For example, the full recovery of the service value of a $20,000 circuit breaker includes not only the $20,000 of original cost, but also, on average, $2,200 to remove the breaker at the end of its life and $200 in salvage value. In this example, the net salvage component is negative $2,000 ($200 - $2,200), and the net salvage percent is negative 10% (($200 - $2,200)/$20,000).

Q. PLEASE DESCRIBE HOW YOU ESTIMATED NET SALVAGE PERCENTAGES.

A. I estimated the net salvage percentages by reviewing the Company's account specific historical salvage and cost of removal data for the period 1961 through 2018 as a

percentage of the associated retired plant, as well as considering industry experience in terms of net salvage estimates for other electric companies.

Q. WERE THE NET SALVAGE PERCENTAGES FOR GENERATING FACILITIES BASED ON THE SAME ANALYSES?

A. Yes, for the interim analyses. The net salvage percentages for generating facilities were based on two components, the interim net salvage percentage and the final net salvage percentage. The interim net salvage percentage is determined based on the cost of removal and gross salvage amounts as a percentage of the associated plant retired for the historical period 1961-2018. Since at this time the Company has not analyzed what it expects it will cost to decommission its non-nuclear power plants, I have assumed for purposes of this particular depreciation study that the final net salvage or dismantlement component (also sometimes referenced as "terminal net salvage") is zero.

Q. DO YOU BELIEVE THAT THE DEPRECIATION RATES SHOULD INCLUDE A DISMANTLEMENT COMPONENT?

A. Yes, because the costs to dismantle or decommission a generating unit or facility is part of the service value of the assets and should be recovered in depreciation rates over the life of the asset. This is particularly important for coal-fired facilities that are being shut down as we are seeing all across the United States. Additionally, waiting until the facility is actually retired to begin recovering the cost to decommission creates intergenerational inequity as customers that did not benefit from the use of the generating facility will have to pay rates that will reflect these end of life costs.

Q. **HAVE AMEREN DEPRECIATION RATES INCLUDED A TERMINAL NET SALVAGE COMPONENT FOR ITS NON-NUCLEAR POWER PLANTS?**

A. No. because as previously noted, the Company has not yet estimated those costs so while I believe such an estimate should be prepared as soon as reasonably possible and that depreciation rates should reflect such costs, I have not reflected them at this time.

Q. PLEASE DESCRIBE THE SECOND PHASE OF THE PROCESS THAT YOU USED IN THE DEPRECIATION STUDY IN WHICH YOU CALCULATED COMPOSITE REMAINING LIVES AND ANNUAL DEPRECIATION ACCRUAL RATES.

A. After I estimated the service life and net salvage characteristics for each depreciable property group, I calculated the annual depreciation accrual rates for each group, using the straight line remaining life method, and using remaining lives weighted consistent with the average service life procedure.

Q. PLEASE DESCRIBE THE STRAIGHT LINE REMAINING LIFE METHOD OF DEPRECIATION.

A. The straight line remaining life method of depreciation allocates the original cost of the property, less accumulated depreciation, less future net salvage, in equal amounts to each year of remaining service life.

Q. PLEASE DESCRIBE AMORTIZATION ACCOUNTING.

A. In amortization accounting, units of property are capitalized in the same manner as they are in depreciation accounting. Amortization accounting is used for accounts with a large number of units, but small asset values. Depreciation accounting is difficult for these assets because periodic inventories are required to properly reflect plant in service. Consequently, retirements are recorded when a vintage is fully amortized rather than as the units are removed from service. That is, there is no

dispersion of retirements. All units are retired when the age of the vintage reaches the amortization period. Each plant account or group of assets is assigned a fixed period which represents an anticipated life during which the assets will render full benefit. For example, in amortization accounting, assets that have a 20-year amortization period will be fully recovered after 20 years of service and taken off the Company's books, but not necessarily removed from service. In contrast, assets that are taken out of service before 20 years remain on the books until the amortization period for that vintage has expired.

Q. FOR WHICH PLANT ACCOUNTS IS AMORTIZATION ACCOUNTING BEING UTILIZED?

A. Amortization accounting is only appropriate for certain General Plant or General Plant related accounts. These accounts are 316.21, 316.22, 316.23, 325.21, 325.22, 325.23, 335.21, 335.22, 335.23, 346.21, 346.22, 346.23, 390.05, 391.0, 391.2, 392.05, 393, 394, 394.05, 395, 397, 397.05 and 398. These accounts represent less than two percent of the Company's depreciable plant.

Q. PLEASE USE AN EXAMPLE TO ILLUSTRATE HOW THE ANNUAL DEPRECIATION ACCRUAL RATE FOR A PARTICULAR GROUP OF PROPERTY IS PRESENTED IN YOUR DEPRECIATION STUDY.

A. I will use Account 362, Station Equipment, as an example because it is one of the largest depreciable mass accounts and represents approximately six percent of total depreciable plant.

The retirement rate method was used to analyze the survivor characteristics of this property group. Aged plant accounting data was compiled from 1932 through 2018 and analyzed in periods that best represent the overall service life of this

property. The life tables for the 1932-2018 and 1989-2018 experience bands are presented on pages VII-154 through VII-159 of the report. The life table displays the retirement and surviving ratios of the aged plant data exposed to retirement by age interval. For example, page VII-154 shows $632,211 retired at age 0.5 with $1,099,062,479 exposed to retirement. Consequently, the retirement ratio is 0.0006 and the surviving ratio is 0.9994. These life tables, or original survivor curves, are plotted along with the estimated smooth survivor curve, the 60-R2.5 on page VII-153.

The net salvage percent is presented on pages VIII-77 through VIII-79. The percentage is based on the result of annual gross salvage minus the cost to remove plant assets as compared to the original cost of plant retired during the period 1961 through 2018. The 58-year period experienced $9,208,669 ($4,922,357 - $14,131,026) in net salvage for $99,922,884 plant retired. The result is negative net salvage of 9 percent ($9,208,669/$99,922,884). Recent trends have shown indications of negative 15 percent, therefore, it was determined that based on industry ranges, historical indications and Company expectation, that negative 10 percent was the most appropriate estimate.

My calculation of the annual depreciation related to the original cost at December 31, 2018, of electric plant is presented on pages IX-105 through IX-107. The calculation is based on the 60-R2.5 survivor curve, 10 percent negative net salvage, the attained age, and the allocated book reserve. The tabulation sets forth the installation year, the original cost, calculated accrued depreciation, allocated book reserve, future accruals, remaining life and annual accrual. These totals are brought forward to the table on page VI-6.

Q. HAVE YOU DEVELOPED DEPRECIATION RATES FOR FUTURE ASSETS?

A. Yes. Ameren has plans to construct wind facilities and storage battery assets during 2020. The rates for the wind generation assets will be based on the interim survivor curve for each account, a negative net salvage percentage for each account and a 30-year life span for all assets at the location. For storage battery assets in generation, transmission and distribution, a rate was developed based on a 10-year average life and 0 percent net salvage. All of these future rates are presented on page VI-7 of Schedule JJS-D2.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes.

JOHN SPANOS

DEPRECIATION EXPERIENCE

Q. Please state your name.

A. My name is John J. Spanos.

Q. What is your educational background?

A. I have Bachelor of Science degrees in Industrial Management and Mathematics from Carnegie-Mellon University and a Master of Business Administration from York College.

Q. Do you belong to any professional societies?

A. Yes. I am a member and past President of the Society of Depreciation Professionals and a member of the American Gas Association/Edison Electric Institute Industry Accounting Committee.

Q. Do you hold any special certification as a depreciation expert?

A. Yes. The Society of Depreciation Professionals has established national standards for depreciation professionals. The Society administers an examination to become certified in this field. I passed the certification exam in September 1997 and was recertified in August 2003, February 2008, January 2013 and February 2018.

Q. Please outline your experience in the field of depreciation.

A. In June 1986, I was employed by Gannett Fleming Valuation and Rate Consultants, Inc. as a Depreciation Analyst. During the period from June 1986 through December, 1995, I helped prepare numerous depreciation and original cost studies for utility companies in various industries. I helped perform depreciation studies for the following telephone companies: United Telephone of Pennsylvania, United Telephone of New Jersey, and Anchorage Telephone Utility. I helped perform depreciation studies for the following

companies in the railroad industry: Union Pacific Railroad, Burlington Northern Railroad, and Wisconsin Central Transportation Corporation.

I helped perform depreciation studies for the following organizations in the electric utility industry: Chugach Electric Association, The Cincinnati Gas and Electric Company (CG&E), The Union Light, Heat and Power Company (ULH&P), Northwest Territories Power Corporation, and the City of Calgary - Electric System.

I helped perform depreciation studies for the following pipeline companies: TransCanada Pipelines Limited, Trans Mountain Pipe Line Company Ltd., Interprovincial Pipe Line Inc., Nova Gas Transmission Limited and Lakehead Pipeline Company.

I helped perform depreciation studies for the following gas utility companies: Columbia Gas of Pennsylvania, Columbia Gas of Maryland, The Peoples Natural Gas Company, T. W. Phillips Gas & Oil Company, CG&E, ULH&P, Lawrenceburg Gas Company and Penn Fuel Gas, Inc.

I helped perform depreciation studies for the following water utility companies: Indiana-American Water Company, Consumers Pennsylvania Water Company and The York Water Company; and depreciation and original cost studies for Philadelphia Suburban Water Company and Pennsylvania-American Water Company.

In each of the above studies, I assembled and analyzed historical and simulated data, performed field reviews, developed preliminary estimates of service life and net salvage, calculated annual depreciation, and prepared reports for submission to state public utility commissions or federal regulatory agencies. I performed these studies under the general direction of William M. Stout, P.E.

In January 1996, I was assigned to the position of Supervisor of Depreciation Studies. In July 1999, I was promoted to the position of Manager, Depreciation and

Valuation Studies. In December 2000, I was promoted to the position as Vice-President of Gannett Fleming Valuation and Rate Consultants, Inc., in April 2012, I was promoted to the position as Senior Vice President of the Valuation and Rate Division of Gannett Fleming Inc. (now doing business as Gannett Fleming Valuation and Rate Consultants, LLC) and in January of 2019, I was promoted to my present position of President of Gannett Fleming Valuation and Rate Consultants, LLC. In my current position I am responsible for conducting all depreciation, valuation and original cost studies, including the preparation of final exhibits and responses to data requests for submission to the appropriate regulatory bodies.

Since January 1996, I have conducted depreciation studies similar to those previously listed including assignments for Pennsylvania-American Water Company; Aqua Pennsylvania; Kentucky-American Water Company; Virginia-American Water Company; Indiana-American Water Company; Iowa-American Water Company; New Jersey-American Water Company; Hampton Water Works Company; Omaha Public Power District; Enbridge Pipe Line Company; Inc.; Columbia Gas of Virginia, Inc.; Virginia Natural Gas Company National Fuel Gas Distribution Corporation - New York and Pennsylvania Divisions; The City of Bethlehem - Bureau of Water; The City of Coatesville Authority; The City of Lancaster - Bureau of Water; Peoples Energy Corporation; The York Water Company; Public Service Company of Colorado; Enbridge Pipelines; Enbridge Gas Distribution, Inc.; Reliant Energy-HLP; Massachusetts-American Water Company; St. Louis County Water Company; Missouri-American Water Company; Chugach Electric Association; Alliant Energy; Oklahoma Gas & Electric Company; Nevada Power Company; Dominion Virginia Power; NUI-Virginia Gas Companies; Pacific Gas & Electric Company; PSI Energy; NUI - Elizabethtown Gas Company; Cinergy Corporation – CG&E; Cinergy Corporation – ULH&P; Columbia Gas of Kentucky; South Carolina Electric & Gas Company; Idaho Power Company; El Paso

Electric Company; Aqua North Carolina; Aqua Ohio; Aqua Texas, Inc.; Aqua Illinois, Inc.; Ameren Missouri; Central Hudson Gas & Electric; Centennial Pipeline Company; CenterPoint Energy-Arkansas; CenterPoint Energy – Oklahoma; CenterPoint Energy – Entex; CenterPoint Energy - Louisiana; NSTAR – Boston Edison Company; Westar Energy, Inc.; United Water Pennsylvania; PPL Electric Utilities; PPL Gas Utilities; Wisconsin Power & Light Company; TransAlaska Pipeline; Avista Corporation; Northwest Natural Gas; Allegheny Energy Supply, Inc.; Public Service Company of North Carolina; South Jersey Gas Company; Duquesne Light Company; MidAmerican Energy Company; Laclede Gas; Duke Energy Company; E.ON U.S. Services Inc.; Elkton Gas Services; Anchorage Water and Wastewater Utility; Kansas City Power and Light; Duke Energy North Carolina; Duke Energy South Carolina; Monongahela Power Company; Potomac Edison Company; Duke Energy Ohio Gas; Duke Energy Kentucky; Duke Energy Indiana; Duke Energy Progress; Northern Indiana Public Service Company; Tennessee-American Water Company; Columbia Gas of Maryland; Maryland-American Water Company; Bonneville Power Administration; NSTAR Electric and Gas Company; EPCOR Distribution, Inc.; B. C. Gas Utility, Ltd; Entergy Arkansas; Entergy Texas; Entergy Mississippi; Entergy Louisiana; Entergy Gulf States Louisiana; the Borough of Hanover; Louisville Gas and Electric Company; Kentucky Utilities Company; Madison Gas and Electric; Central Maine Power; PEPCO; PacifiCorp; Minnesota Energy Resource Group; Jersey Central Power & Light Company; Cheyenne Light, Fuel and Power Company; United Water Arkansas; Central Vermont Public Service Corporation; Green Mountain Power; Portland General Electric Company; Atlantic City Electric; Nicor Gas Company; Black Hills Power; Black Hills Colorado Gas; Black Hills Kansas Gas; Black Hills Service Company; Black Hills Utility Holdings; Public Service Company of Oklahoma; City of

Dubois; Peoples Gas Light and Coke Company; North Shore Gas Company; Connecticut Light and Power; New York State Electric and Gas Corporation; Rochester Gas and Electric Corporation; Greater Missouri Operations; Tennessee Valley Authority; Omaha Public Power District; Indianapolis Power & Light Company; Vermont Gas Systems, Inc.; Metropolitan Edison; Pennsylvania Electric; West Penn Power; Pennsylvania Power; PHI Service Company - Delmarva Power and Light; Atmos Energy Corporation; Citizens Energy Group; PSE&G Company; Berkshire Gas Company; Alabama Gas Corporation; Mid-Atlantic Interstate Transmission, LLC; SUEZ Water; WEC Energy Group; Rocky Mountain Natural Gas, LLC; Illinois-American Water Company and Northern Illinois Gas Company.

My additional duties include determining final life and salvage estimates, conducting field reviews, presenting recommended depreciation rates to management for its consideration and supporting such rates before regulatory bodies.

Q. Have you submitted testimony to any state utility commission on the subject of utility plant depreciation?

A. Yes. I have submitted testimony to the Pennsylvania Public Utility Commission; the Commonwealth of Kentucky Public Service Commission; the Public Utilities Commission of Ohio; the Nevada Public Utility Commission; the Public Utilities Board of New Jersey; the Missouri Public Service Commission; the Massachusetts Department of Telecommunications and Energy; the Alberta Energy & Utility Board; the Idaho Public Utility Commission; the Louisiana Public Service Commission; the State Corporation Commission of Kansas; the Oklahoma Corporate Commission; the Public Service Commission of South Carolina; Railroad Commission of Texas – Gas Services Division; the New York Public Service Commission; Illinois Commerce Commission; the Indiana

Utility Regulatory Commission; the California Public Utilities Commission; the Federal Energy Regulatory Commission ("FERC"); the Arkansas Public Service Commission; the Public Utility Commission of Texas; Maryland Public Service Commission; Washington Utilities and Transportation Commission; The Tennessee Regulatory Commission; the Regulatory Commission of Alaska; Minnesota Public Utility Commission; Utah Public Service Commission; District of Columbia Public Service Commission; the Mississippi Public Service Commission; Delaware Public Service Commission; Virginia State Corporation Commission; Colorado Public Utility Commission; Oregon Public Utility Commission; South Dakota Public Utilities Commission; Wisconsin Public Service Commission; Wyoming Public Service Commission; the Public Service Commission of West Virginia; Maine Public Utility Commission; Iowa Utility Board; Connecticut Public Utilities Regulatory Authority; New Mexico Public Regulation Commission; Commonwealth of Massachusetts Department of Public Utilities; Rhode Island Public Utilities Commission and the North Carolina Utilities Commission.

Q. Have you had any additional education relating to utility plant depreciation?

A. Yes. I have completed the following courses conducted by Depreciation Programs, Inc.: "Techniques of Life Analysis," "Techniques of Salvage and Depreciation Analysis," "Forecasting Life and Salvage," "Modeling and Life Analysis Using Simulation," and "Managing a Depreciation Study." I have also completed the "Introduction to Public Utility Accounting" program conducted by the American Gas Association.

Q. Does this conclude your qualification statement?

A. Yes.

LIST OF CASES IN WHICH JOHN J. SPANOS SUBMITTED TESTIMONY

	Year	Jurisdiction	Docket No.	Client Utility	Subject
01.	1998	PA PUC	R-00984375	City of Bethlehem – Bureau of Water	Original Cost and Depreciation
02.	1998	PA PUC	R-00984567	City of Lancaster	Original Cost and Depreciation
03.	1999	PA PUC	R-00994605	The York Water Company	Depreciation
04.	2000	D.T.&E.	DTE 00-105	Massachusetts-American Water Company	Depreciation
05.	2001	PA PUC	R-00016114	City of Lancaster	Original Cost and Depreciation
06.	2001	PA PUC	R-00017236	The York Water Company	Depreciation
07.	2001	PA PUC	R-00016339	Pennsylvania-American Water Company	Depreciation
08.	2001	OH PUC	01-1228-GA-AIR	Cinergy Corp – Cincinnati Gas & Elect Company	Depreciation
09.	2001	KY PSC	2001-092	Cinergy Corp – Union Light, Heat & Power Co.	Depreciation
10.	2002	PA PUC	R-00016750	Philadelphia Suburban Water Company	Depreciation
11.	2002	KY PSC	2002-00145	Columbia Gas of Kentucky	Depreciation
12.	2002	NJ BPU	GF02040245	NUI Corporation/Elizabethtown Gas Company	Depreciation
13.	2002	ID PUC	IPC-E-03-7	Idaho Power Company	Depreciation
14.	2003	PA PUC	R-0027975	The York Water Company	Depreciation
15.	2003	IN URC	R-0027975	Cinergy Corp – PSI Energy, Inc.	Depreciation
16.	2003	PA PUC	R-00038304	Pennsylvania-American Water Company	Depreciation
17.	2003	MO PSC	WR-2003-0500	Missouri-American Water Company	Depreciation
18.	2003	FERC	ER-03-1274-000	NSTAR-Boston Edison Company	Depreciation
19.	2003	NJ BPU	BPU 03080683	South Jersey Gas Company	Depreciation
20.	2003	NV PUC	03-10001	Nevada Power Company	Depreciation
21.	2003	LA PSC	U-27676	CenterPoint Energy – Arkla	Depreciation
22.	2003	PA PUC	R-00038805	Pennsylvania Suburban Water Company	Depreciation
23.	2004	AB En/Util Bd	1306821	EPCOR Distribution, Inc.	Depreciation
24.	2004	PA PUC	R-00038168	National Fuel Gas Distribution Corp (PA)	Depreciation
25.	2004	PA PUC	R-00049255	PPL Electric Utilities	Depreciation
26.	2004	PA PUC	R-00049165	The York Water Company	Depreciation
27.	2004	OK Corp Cm	PUC 200400187	CenterPoint Energy – Arkla	Depreciation
28.	2004	OH PUC	04-680-EI-AIR	Cinergy Corp. – Cincinnati Gas and Electric Company	Depreciation
29.	2004	RR Com of TX	GUD#	CenterPoint Energy – Entex Gas Services Div.	Depreciation
30.	2004	NY PUC	04-G-1047	National Fuel Gas Distribution Gas (NY)	Depreciation
31.	2004	AR PSC	04-121-U	CenterPoint Energy – Arkla	Depreciation
32.	2005	IL CC	05-	North Shore Gas Company	Depreciation
33.	2005	IL CC	05-	Peoples Gas Light and Coke Company	Depreciation
34.	2005	KY PSC	2005-00042	Union Light Heat & Power	Depreciation

LIST OF CASES IN WHICH JOHN J. SPANOS SUBMITTED TESTIMONY, cont.

	Year	Jurisdiction	Docket No.	Client Utility	Subject
35.	2005	IL CC	05-0308	MidAmerican Energy Company	Depreciation
36.	2005	MO PSC	GF-2005	Laclede Gas Company	Depreciation
37.	2005	KS CC	05-WSEE-981-RTS	Westar Energy	Depreciation
38.	2005	RR Com of TX	GUD #	CenterPoint Energy – Entex Gas Services Div.	Depreciation
39.	2005	FERC		Cinergy Corporation	Accounting
40.	2005	OK CC	PUD 200500151	Oklahoma Gas and Electric Company	Depreciation
41.	2005	MA Dept Tele-com & Ergy	DTE 05-85	NSTAR	Depreciation
42.	2005	NY PUC	05-E-934/05-G-0935	Central Hudson Gas & Electric Company	Depreciation
43.	2005	AK Reg Com	U-04-102	Chugach Electric Association	Depreciation
44.	2005	CA PUC	A05-12-002	Pacific Gas & Electric	Depreciation
45.	2006	PA PUC	R-00051030	Aqua Pennsylvania, Inc.	Depreciation
46.	2006	PA PUC	R-00051178	T.W. Phillips Gas and Oil Company	Depreciation
47.	2006	NC Util Cm.		Pub. Service Company of North Carolina	Depreciation
48.	2006	PA PUC	R-00051167	City of Lancaster	Depreciation
49.	2006	PA PUC	R00061346	Duquesne Light Company	Depreciation
50.	2006	PA PUC	R-00061322	The York Water Company	Depreciation
51.	2006	PA PUC	R-00051298	PPL GAS Utilities	Depreciation
52.	2006	PUC of TX	32093	CenterPoint Energy – Houston Electric	Depreciation
53.	2006	KY PSC	2006-00172	Duke Energy Kentucky	Depreciation
54.	2006	SC PSC		SCANA	
55.	2006	AK Reg Com	U-06-6	Municipal Light and Power	Depreciation
56.	2006	DE PSC	06-284	Delmarva Power and Light	Depreciation
57.	2006	IN URC	IURC43081	Indiana American Water Company	Depreciation
58.	2006	AK Reg Com	U-06-134	Chugach Electric Association	Depreciation
59.	2006	MO PSC	WR-2007-0216	Missouri American Water Company	Depreciation
60.	2006	FERC	ISO82, ETC. AL	TransAlaska Pipeline	Depreciation
61.	2006	PA PUC	R-00061493	National Fuel Gas Distribution Corp. (PA)	Depreciation
62.	2007	NC Util Com.	E-7 SUB 828	Duke Energy Carolinas, LLC	Depreciation
63.	2007	OH PSC	08-709-EL-AIR	Duke Energy Ohio Gas	Depreciation
64.	2007	PA PUC	R-00072155	PPL Electric Utilities Corporation	Depreciation
65.	2007	KY PSC	2007-00143	Kentucky American Water Company	Depreciation

LIST OF CASES IN WHICH JOHN J. SPANOS SUBMITTED TESTIMONY, cont.

	Year	Jurisdiction	Docket No.	Client Utility	Subject
66.	2007	PA PUC	R-00072229	Pennsylvania American Water Company	Depreciation
67.	2007	KY PSC	2007-0008	NiSource – Columbia Gas of Kentucky	Depreciation
68.	2007	NY PSC	07-G-0141	National Fuel Gas Distribution Corp (NY)	Depreciation
69.	2008	AK PSC	U-08-004	Anchorage Water & Wastewater Utility	Depreciation
70.	2008	TN Reg Auth	08-00039	Tennessee-American Water Company	Depreciation
71.	2008	DE PSC	08-96	Artesian Water Company	Depreciation
72.	2008	PA PUC	R-2008-2023067	The York Water Company	Depreciation
73.	2008	KS CC	08-WSEE1-RTS	Westar Energy	Depreciation
74.	2008	IN URC	43526	Northern Indiana Public Service Company	Depreciation
75.	2008	IN URC	43501	Duke Energy Indiana	Depreciation
76.	2008	MD PSC	9159	NiSource – Columbia Gas of Maryland	Depreciation
77.	2008	KY PSC	2008-000251	Kentucky Utilities	Depreciation
78.	2008	KY PSC	2008-000252	Louisville Gas & Electric	Depreciation
79.	2008	PA PUC	2008-20322689	Pennsylvania American Water Co. - Wastewater	Depreciation
80.	2008	NY PSC	08-E887/08-00888	Central Hudson	Depreciation
81.	2008	WV TC	VE-080416/VG-8080417	Avista Corporation	Depreciation
82.	2008	IL CC	ICC-09-166	Peoples Gas, Light and Coke Company	Depreciation
83.	2009	IL CC	ICC-09-167	North Shore Gas Company	Depreciation
84.	2009	DC PSC	1076	Potomac Electric Power Company	Depreciation
85.	2009	KY PSC	2009-00141	NiSource – Columbia Gas of Kentucky	Depreciation
86.	2009	FERC	ER08-1056-002	Entergy Services	Depreciation
87.	2009	PA PUC	R-2009-2097323	Pennsylvania American Water Company	Depreciation
88.	2009	NC Util Cm	E-7, Sub 090	Duke Energy Carolinas, LLC	Depreciation
89.	2009	KY PSC	2009-00202	Duke Energy Kentucky	Depreciation
90.	2009	VA St. CC	PUE-2009-00059	Aqua Virginia, Inc.	Depreciation
91.	2009	PA PUC	2009-2132019	Aqua Pennsylvania, Inc.	Depreciation
92.	2009	MS PSC	09-	Entergy Mississippi	Depreciation
93.	2009	AK PSC	09-08-U	Entergy Arkansas	Depreciation
94.	2009	TX PUC	37744	Entergy Texas	Depreciation
95.	2009	TX PUC	37690	El Paso Electric Company	Depreciation
96.	2009	PA PUC	R-2009-2106908	The Borough of Hanover	Depreciation
97.	2009	KS CC	10-KCPE-415-RTS	Kansas City Power & Light	Depreciation
98.	2009	PA PUC	R-2009-	United Water Pennsylvania	Depreciation

LIST OF CASES IN WHICH JOHN J. SPANOS SUBMITTED TESTIMONY, cont.

	Year	Jurisdiction	Docket No.	Client Utility	Subject
99.	2009	OH PUC		Aqua Ohio Water Company	Depreciation
100.	2009	WI PSC	3270-DU-103	Madison Gas & Electric Company	Depreciation
101.	2009	MO PSC	WR-2010	Missouri American Water Company	Depreciation
102.	2009	AK Reg Cm	U-09-097	Chugach Electric Association	Depreciation
103.	2010	IN URC	43969	Northern Indiana Public Service Company	Depreciation
104.	2010	WI PSC	6690-DU-104	Wisconsin Public Service Corp.	Depreciation
105.	2010	PA PUC	R-2010-2161694	PPL Electric Utilities Corp.	Depreciation
106.	2010	KY PSC	2010-00036	Kentucky American Water Company	Depreciation
107.	2010	PA PUC	R-2009-2149262	Columbia Gas of Pennsylvania	Depreciation
108.	2010	MO PSC	GR-2010-0171	Laclede Gas Company	Depreciation
109.	2010	SC PSC	2009-489-E	South Carolina Electric & Gas Company	Depreciation
110.	2010	NJ BD OF PU	ER09080664	Atlantic City Electric	Depreciation
111.	2010	VA St. CC	PUE-2010-00001	Virginia American Water Company	Depreciation
112.	2010	PA PUC	R-2010-2157140	The York Water Company	Depreciation
113.	2010	MO PSC	ER-2010-0356	Greater Missouri Operations Company	Depreciation
114.	2010	MO PSC	ER-2010-0355	Kansas City Power and Light	Depreciation
115.	2010	PA PUC	R-2010-2167797	T.W. Phillips Gas and Oil Company	Depreciation
116.	2010	PSC SC	2009-489-E	SCANA – Electric	Depreciation
117.	2010	PA PUC	R-2010-22010702	Peoples Natural Gas, LLC	Depreciation
118.	2010	AK PSC	10-067-U	Oklahoma Gas and Electric Company	Depreciation
119.	2010	IN URC		Northern Indiana Public Serv. Company - NIFL	Depreciation
120.	2010	IN URC		Northern Indiana Public Serv. Co. - Kokomo	Depreciation
121.	2010	PA PUC	R-2010-2166212	Pennsylvania American Water Co. - WW	Depreciation
122.	2010	NC Util Cn.	W-218,SUB310	Aqua North Carolina, Inc.	Depreciation
123.	2011	OH PUC	11-4161-WS-AIR	Ohio American Water Company	Depreciation
124.	2011	MS PSC	EC-123-0082-00	Entergy Mississippi	Depreciation
125.	2011	CO PUC	11AL-387E	Black Hills Colorado	Depreciation
126.	2011	PA PUC	R-2010-2215623	Columbia Gas of Pennsylvania	Depreciation
127.	2011	PA PUC	R-2010-2179103	City of Lancaster – Bureau of Water	Depreciation
128.	2011	IN URC	43114 IGCC 4S	Duke Energy Indiana	Depreciation
129.	2011	FERC	IS11-146-000	Enbridge Pipelines (Southern Lights)	Depreciation
130.	2011	IL CC	11-0217	MidAmerican Energy Corporation	Depreciation
131.	2011	OK CC	201100087	Oklahoma Gas & Electric Company	Depreciation
132.	2011	PA PUC	2011-2232243	Pennsylvania American Water Company	Depreciation

LIST OF CASES IN WHICH JOHN J. SPANOS SUBMITTED TESTIMONY, cont.

	Year	Jurisdiction	Docket No.	Client Utility	Subject
133.	2011	FERC	2011-2232243	Carolina Gas Transmission	Depreciation
134.	2012	WA UTC	UE-120436/UG-120437	Avista Corporation	Depreciation
135.	2012	AK Reg Cm	U-12-009	Chugach Electric Association	Depreciation
136.	2012	MA PUC	DPU 12-25	Columbia Gas of Massachusetts	Depreciation
137.	2012	TX PUC	40094	El Paso Electric Company	Depreciation
138.	2012	ID PUC	IPC-E-12	Idaho Power Company	Depreciation
139.	2012	PA PUC	R-2012-2290597	PPL Electric Utilities	Depreciation
140.	2012	PA PUC	R-2012-2311725	Borough of Hanover – Bureau of Water	Depreciation
141.	2012	KY PSC	2012-00222	Louisville Gas and Electric Company	Depreciation
142.	2012	KY PSC	2012-00221	Kentucky Utilities Company	Depreciation
143.	2012	PA PUC	R-2012-2285985	Peoples Natural Gas Company	Depreciation
144.	2012	DC PSC	Case 1087	Potomac Electric Power Company	Depreciation
145.	2012	OH PSC	12-1682-EL-AIR	Duke Energy Ohio (Electric)	Depreciation
146.	2012	OH PSC	12-1685-GA-AIR	Duke Energy Ohio (Gas)	Depreciation
147.	2012	PA PUC	R-2012-2310366	City of Lancaster – Sewer Fund	Depreciation
148.	2012	PA PUC	R-2012-2321748	Columbia Gas of Pennsylvania	Depreciation
149.	2012	FERC	ER-12-2681-000	ITC Holdings	Depreciation
150.	2012	MO PSC	ER-2012-0174	Kansas City Power and Light	Depreciation
151.	2012	MO PSC	ER-2012-0175	KCPL Greater Missouri Operations Company	Depreciation
152.	2012	MO PSC	GO-2012-0363	Laclede Gas Company	Depreciation
153.	2012	MN PUC	G007,001/D-12-533	Integrys – MN Energy Resource Group	Depreciation
153.	2012	TX PUC		Aqua Texas	Depreciation
155.	2012	PA PUC	2012-2336379	York Water Company	Depreciation
156.	2013	NJ BPU	ER12121071	PHI Service Company– Atlantic City Electric	Depreciation
157.	2013	KY PSC	2013-00167	Columbia Gas of Kentucky	Depreciation
158.	2013	VA St CC	2013-00020	Virginia Electric and Power Company	Depreciation
159.	2013	IA Util Bd	2013-0004	MidAmerican Energy Corporation	Depreciation
160.	2013	PA PUC	2013-2355276	Pennsylvania American Water Company	Depreciation
161.	2013	NY PSC	13-E-0030, 13-G-0031, 13-S-0032	Consolidated Edison of New York	Depreciation
162.	2013	PA PUC	2013-2355886	Peoples TWP LLC	Depreciation
163.	2013	TN Reg Auth	12-0504	Tennessee American Water	Depreciation
164.	2013	ME PUC	2013-168	Central Maine Power Company	Depreciation
165.	2013	DC PSC	Case 1103	PHI Service Company – PEPCO	Depreciation

LIST OF CASES IN WHICH JOHN J. SPANOS SUBMITTED TESTIMONY, cont.

	Year	Jurisdiction	Docket No.	Client Utility	Subject
166.	2013	WY PSC	2003-ER-13	Cheyenne Light, Fuel and Power Company	Depreciation
167.	2013	FERC	ER13- -0000	Kentucky Utilities	Depreciation
168.	2013	FERC	ER13- -0000	MidAmerican Energy Company	Depreciation
169.	2013	FERC	ER13- -0000	PPL Utilities	Depreciation
170.	2013	PA PUC	R-2013-2372129	Duquesne Light Company	Depreciation
171.	2013	NJ BPU	ER12111052	Jersey Central Power and Light Company	Depreciation
172.	2013	PA PUC	R-2013-2390244	Bethlehem, City of – Bureau of Water	Depreciation
173.	2013	OK CC	UM 1679	Oklahoma, Public Service Company of	Depreciation
174.	2013	IL CC	13-0500	Nicor Gas Company	Depreciation
175.	2013	WY PSC	20000-427-EA-13	PacifiCorp	Depreciation
176.	2013	UT PSC	13-035-02	PacifiCorp	Depreciation
177.	2013	OR PUC	UM 1647	PacifiCorp	Depreciation
178.	2013	PA PUC	2013-2350509	Dubois, City of	Depreciation
179.	2014	IL CC	14-0224	North Shore Gas Company	Depreciation
180.	2014	FERC	ER14-	Duquesne Light Company	Depreciation
181.	2014	SD PUC	EL14-026	Black Hills Power Company	Depreciation
182.	2014	WY PSC	20002-91-ER-14	Black Hills Power Company	Depreciation
183.	2014	PA PUC	2014-2428304	Borough of Hanover – Municipal Water Works	Depreciation
184.	2014	PA PUC	2014-2406274	Columbia Gas of Pennsylvania	Depreciation
185.	2014	IL CC	14-0225	Peoples Gas Light and Coke Company	Depreciation
186.	2014	MO PSC	ER-2014-0258	Ameren Missouri	Depreciation
187.	2014	KS CC	14-BHCG-502-RTS	Black Hills Service Company	Depreciation
188.	2014	KS CC	14-BHCG-502-RTS	Black Hills Utility Holdings	Depreciation
189.	2014	KS CC	14-BHCG-502-RTS	Black Hills Kansas Gas	Depreciation
190.	2014	PA PUC	2014-2418872	Lancaster, City of – Bureau of Water	Depreciation
191.	2014	WV PSC	14-0701-E-D	First Energy – MonPower/PotomacEdison	Depreciation
192	2014	VA St CC	PUC-2014-00045	Aqua Virginia	Depreciation
193.	2014	VA St CC	PUE-2013	Virginia American Water Company	Depreciation
194.	2014	OK CC	PUD201400229	Oklahoma Gas and Electric Company	Depreciation
195.	2014	OR PUC	UM1679	Portland General Electric	Depreciation
196.	2014	IN URC	Cause No. 44576	Indianapolis Power & Light	Depreciation
197.	2014	MA DPU	DPU. 14-150	NSTAR Gas	Depreciation
198.	2014	CT PURA	14-05-06	Connecticut Light and Power	Depreciation
199.	2014	MO PSC	ER-2014-0370	Kansas City Power & Light	Depreciation

LIST OF CASES IN WHICH JOHN J. SPANOS SUBMITTED TESTIMONY, cont.

	Year	Jurisdiction	Docket No.	Client Utility	Subject
200.	2014	KY PSC	2014-00371	Kentucky Utilities Company	Depreciation
201.	2014	KY PSC	2014-00372	Louisville Gas and Electric Company	Depreciation
202.	2015	PA PUC	R-2015-2462723	United Water Pennsylvania Inc.	Depreciation
203.	2015	PA PUC	R-2015-2468056	NiSource - Columbia Gas of Pennsylvania	Depreciation
204.	2015	NY PSC	15-E-0283/15-G-0284	New York State Electric and Gas Corporation	Depreciation
205.	2015	NY PSC	15-E-0285/15-G-0286	Rochester Gas and Electric Corporation	Depreciation
206.	2015	MO PSC	WR-2015-0301/SR-2015-0302	Missouri American Water Company	Depreciation
207.	2015	OK CC	PUD 201500208	Oklahoma, Public Service Company of	Depreciation
208.	2015	WV PSC	15-0676-W-42T	West Virginia American Water Company	Depreciation
209.	2015	PA PUC	2015-2469275	PPL Electric Utilities	Depreciation
210.	2015	IN URC	Cause No. 44688	Northern Indiana Public Service Company	Depreciation
211.	2015	OH PSC	14-1929-EL-RDR	First Energy-Ohio Edison/Cleveland Electric/ Toledo Edison	Depreciation
212.	2015	NM PRC	15-00127-UT	El Paso Electric	Depreciation
213.	2015	TX PUC	PUC-44941; SOAH 473-15-5257	El Paso Electric	Depreciation
214.	2015	WI PSC	3270-DU-104	Madison Gas and Electric Company	Depreciation
215.	2015	OK CC	PUD 201500273	Oklahoma Gas and Electric	Depreciation
216.	2015	KY PSC	Doc. No. 2015-00418	Kentucky American Water Company	Depreciation
217.	2015	NC UC	Doc. No. G-5, Sub 565	Public Service Company of North Carolina	Depreciation
218.	2016	WA UTC	Docket UE-17	Puget Sound Energy	Depreciation
219.	2016	NY PSC	Case No. 16-W-0130	SUEZ Water New York, Inc.	Depreciation
220.	2016	MO PSC	ER-2016-0156	KCPL – Greater Missouri	Depreciation
221.	2016	WI PSC		Wisconsin Public Service Commission	Depreciation
222.	2016	KY PSC	Case No. 2016-00026	Kentucky Utilities Company	Depreciation
223.	2016	KY PSC	Case No. 2016-00027	Louisville Gas and Electric Company	Depreciation
224.	2016	OH PUC	Case No. 16-0907-WW-AIR	Aqua Ohio	Depreciation
225.	2016	MD PSC	Case 9417	NiSource - Columbia Gas of Maryland	Depreciation
226.	2016	KY PSC	2016-00162	Columbia Gas of Kentucky	Depreciation
227.	2016	DE PSC	16-0649	Delmarva Power and Light Company – Electric	Depreciation
228.	2016	DE PSC	16-0650	Delmarva Power and Light Company – Gas	Depreciation
229.	2016	NY PSC	Case 16-G-0257	National Fuel Gas Distribution Corp – NY Div	Depreciation
230.	2016	PA PUC	R-2016-2537349	Metropolitan Edison Company	Depreciation
231.	2016	PA PUC	R-2016-2537352	Pennsylvania Electric Company	Depreciation
232.	2016	PA PUC	R-2016-2537355	Pennsylvania Power Company	Depreciation

LIST OF CASES IN WHICH JOHN J. SPANOS SUBMITTED TESTIMONY, cont.

	Year	Jurisdiction	Docket No.	Client Utility	Subject
233.	2016	PA PUC	R-2016-2537359	West Penn Power Company	Depreciation
234.	2016	PA PUC	R-2016-2529660	NiSource - Columbia Gas of PA	Depreciation
235.	2016	KY PSC	Case No. 2016-00063	Kentucky Utilities / Louisville Gas & Electric Co	Depreciation
236.	2016	MO PSC	ER-2016-0285	KCPL Missouri	Depreciation
237.	2016	AR PSC	16-052-U	Oklahoma Gas & Electric Co	Depreciation
238.	2016	PSCW	6680-DU-104	Wisconsin Power and Light	Depreciation
239.	2016	ID PUC	IPC-E-16-23	Idaho Power Company	Depreciation
240.	2016	OR PUC	UM1801	Idaho Power Company	Depreciation
241.	2016	ILL CC	16-	MidAmerican Energy Company	Depreciation
242.	2016	KY PSC	Case No. 2016-00370	Kentucky Utilities Company	Depreciation
243.	2016	KY PSC	Case No. 2016-00371	Louisville Gas and Electric Company	Depreciation
244.	2016	IN URC		Indianapolis Power & Light	Depreciation
245.	2016	AL RC	U-16-081	Chugach Electric Association	Depreciation
246.	2017	MA DPU	D.P.U. 17-05	NSTAR Electric Company and Western Massachusetts Electric Company	Depreciation
247.	2017	TX PUC	PUC-26831, SOAH 973-17-2686	El Paso Electric Company	Depreciation
248.	2017	WA UTC	UE-17033 and UG-170034	Puget Sound Energy	Depreciation
249.	2017	OH PUC	Case No. 17-0032-EL-AIR	Duke Energy Ohio	Depreciation
250.	2017	VA SCC	Case No. PUE-2016-00413	Virginia Natural Gas, Inc.	Depreciation
251.	2017	OK CC	Case No. PUD201700151	Public Service Company of Oklahoma	Depreciation
252.	2017	MD PSC	Case No. 9447	Columbia Gas of Maryland	Depreciation
253.	2017	NC UC	Docket No. E-2, Sub 1142	Duke Energy Progress	Depreciation
254.	2017	VA SCC	Case No. PUR-2017-00090	Dominion Virginia Electric and Power Company	Depreciation
255.	2017	FERC	ER17-1162	MidAmerican Energy Company	Depreciation
256.	2017	PA PUC	R-2017-2595853	Pennsylvania American Water Company	Depreciation
257.	2017	OR PUC	UM1809	Portland General Electric	Depreciation
258.	2017	FERC	ER17-217	Jersey Central Power & Light	Depreciation
259.	2017	FERC	ER17-211	Mid-Atlantic Interstate Transmission, LLC	Depreciation
260.	2017	MN PUC	Docket No. G007/D-17-442	Minnesota Energy Resources Corporation	Depreciation
261.	2017	IL CC	Docket No. 17-0124	Northern Illinois Gas Company	Depreciation
262.	2017	OR PUC	UM1808	Northwest Natural Gas Company	Depreciation
263.	2017	NY PSC	Case No. 17-W-0528	SUEZ Water Owego-Nichols	Depreciation
264.	2017	MO PSC	GR-2017-0215	Laclede Gas Company	Depreciation
265.	2017	MO PSC	GR-2017-0216	Missouri Gas Energy	Depreciation

LIST OF CASES IN WHICH JOHN J. SPANOS SUBMITTED TESTIMONY, cont.

	Year	Jurisdiction	Docket No.	Client Utility	Subject
266.	2017	ILL CC	Docket No. 17-0337	Illinois-American Water Company	Depreciation
267.	2017	FERC	Docket No. ER17- _	PPL Electric Utilities Corporation	Depreciation
268.	2017	IN URC	Cause No. 44988	Northern Indiana Public Service Company	Depreciation
269.	2017	NJ BPU	BPU Docket No. WR17090985	New Jersey American Water Company, Inc.	Depreciation
270.	2017	RI PUC	Docket No. 4800	SUEZ Water Rhode Island	Depreciation
271.	2017	OK CC	Cause No. PUD 201700496	Oklahoma Gas and Electric Company	Depreciation
272.	2017	NJ BPU	ER18010029 & GR18010030	Public Service Electric and Gas Company	Depreciation
273.	2017	NC Util Com.	Docket No. E-7, SUB 1146	Duke Energy Carolinas, LLC	Depreciation
274.	2017	KY PSC	Case No. 2017-00321	Duke Energy Kentucky, Inc.	Depreciation
275.	2017	MA DPU	D.P.U. 18-40	Berkshire Gas Company	Depreciation
276.	2018	IN IURC	Cause No. 44992	Indiana-American Water Company, Inc.	Depreciation
277.	2018	IN IURC	Cause No. 45029	Indianapolis Power and Light	Depreciation
278.	2018	NC Util Com.	Docket No. W-218, Sub 497	Aqua North Carolina, Inc.	Depreciation
279.	2018	PA PUC	Docket No. R-2018-2647577	NiSource - Columbia Gas of Pennsylvania, Inc.	Depreciation
280.	2018	OR PUC	Docket UM 1933	Avista Corporation	Depreciation
281.	2018	WA UTC	Docket No. UE-108167	Avista Corporation	Depreciation
282.	2018	ID PUC	AVU-E-18-03, AVU-G-18-02	Avista Corporation	Depreciation
283.	2018	IN URC	Cause No. 45039	Citizens Energy Group	Depreciation
284.	2018	FERC	Docket No. ER18-	Duke Energy Progress	Depreciation
285.	2018	PA PUC	Docket No. R-2018-3000124	Duquesne Light Company	Depreciation
286.	2018	MD PSC	Case No. 9480	NiSource - Columbia Gas of Maryland	Depreciation
287.	2018	MA DPU	D.P.U. 18-45	NiSource - Columbia Gas of Massachusetts	Depreciation
288.	2018	OH PUC	Case No. 18-0299-GA-ALT	Vectren Energy Delivery of Ohio	Depreciation
289.	2018	PA PUC	Docket No. R-2018-3000834	SUEZ Water Pennsylvania Inc.	Depreciation
290.	2018	MD PSC	Case No. 9847	Maryland-American Water Company	Depreciation
291.	2018	PA PUC	Docket No. R-2018-3000019	The York Water Company	Depreciation
292.	2018	FERC	Docket Nos. ER-18-2231-000	Duke Energy Carolinas, LLC	Depreciation
293.	2018	KY PSC	Case No. 2018-00261	Duke Energy Kentucky, Inc.	Depreciation
294.	2018	NJ BPU	BPU Docket No. WR18050593	SUEZ Water New Jersey	Depreciation
295.	2018	WA UTC	Docket No. UE-180778	PacifiCorp	Depreciation
296.	2018	UT PSC	Docket No. 18-035-36	PacifiCorp	Depreciation
297.	2018	OR PUC	Docket No. UM-1968	PacifiCorp	Depreciation
298.	2018	ID PUC	Case No. PAC-E-18-08	PacifiCorp	Depreciation
299.	2018	WY PSC	20000-539-EA-18	PacifiCorp	Depreciation
300.	2018	PA PUC	Docket No. R-2018-3003068	Aqua Pennsylvania, Inc.	Depreciation

LIST OF CASES IN WHICH JOHN J. SPANOS SUBMITTED TESTIMONY, cont.

	Year	Jurisdiction	Docket No.	Client Utility	Subject
301.	2018	IL CC	Docket No. 18-1467	Aqua Illinois, Inc.	Depreciation
302.	2018	KY PSC	Case No. 2018-00294	Louisville Gas & Electric Company	Depreciation
303.	2018	KY PSC	Case No. 2018-00295	Kentucky Utilities Company	Depreciation
304.	2018	IN URC	Cause No. 45159	Northern Indiana Public Service Company	Depreciation
305.	2018	VA SCC	Case No. PUR-2019-00175	Virginia American Water Company	Depreciation
306.	2019	PA PUC	Docket No. R-2018-3006818	Peoples Natural Gas Company, LLC	Depreciation
307.	2019	OK CC	Cause No. PUD201800140	Oklahoma Gas and Electric Company	Depreciation
308.	2019	MD PSC	Case No. 9490	FirstEnergy – Potomac Edison	Depreciation
309.	2019	SC PSC	Docket No. 2018-318-E	Duke Energy Progress	Depreciation
310.	2019	SC PSC	Docket No. 2018-319-E	Duke Energy Carolinas	Depreciation

2018 DEPRECIATION STUDY

CALCULATED ANNUAL DEPRECIATION ACCRUALS RELATED TO ELECTRIC PLANT AS OF DECEMBER 31, 2018

Prepared by:

Excellence Delivered ***As Promised***

Schedule JJS-D2

AMEREN MISSOURI

ST. LOUIS, MISSOURI

2018 DEPRECIATION STUDY

CALCULATED ANNUAL DEPRECIATION
ACCRUALS RELATED TO ELECTRIC PLANT
AS OF DECEMBER 31, 2018

GANNETT FLEMING VALUATION AND RATE CONSULTANTS, LLC
Camp Hill, Pennsylvania

Schedule JJS-D2

Gannett Fleming

Excellence Delivered ***As Promised***

June 21, 2019

Ameren Missouri
1901 Choteau Boulevard
St. Louis, MO 63103

Attention Wendy K. Tatro, Esq.
Director and Asst. General Counsel

Ladies and Gentlemen:

Pursuant to your request, we have conducted a depreciation study related to the electric plant of Ameren Missouri as of December 31, 2018. The attached report presents a description of the methods used in the estimation of depreciation, the summary of annual depreciation accrual rates, the statistical support for the life and net salvage estimates and the detailed tabulations of annual depreciation.

We gratefully acknowledge the assistance of Ameren Missouri personnel in the conduct of this study.

Respectfully submitted,

GANNETT FLEMING VALUATION
AND RATE CONSULTANTS, LLC

John J. Spanos

JOHN J. SPANOS
President

JJS:mle

065221

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AMEREN MISSOURI

DEPRECIATION STUDY

EXECUTIVE SUMMARY

Pursuant to Ameren Missouri's ("Ameren" or "Company") request, Gannett Fleming Valuation and Rate Consultants, LLC ("Gannett Fleming") conducted a depreciation study related to the electric plant as of December 31, 2018. The purpose of this study was to determine the annual depreciation accrual rates and amounts for book and ratemaking purposes.

The depreciation rates are based on the straight line method using the average service life ("ASL") procedure and were applied on a remaining life basis. The calculations were based on attained ages and estimated average service life, and forecasted net salvage characteristics for each depreciable group of assets.

Ameren's accounting policy has not changed since the last depreciation study was prepared. However, there has been significant increases in capital additions and retirements of assets, particularly at generating facilities. These changes in plant have caused the proposed depreciation rates to increase as compared to the previous depreciation study as of December 31, 2013.

Gannett Fleming recommends the calculated annual depreciation accrual rates set forth herein apply specifically to electric plant in service as of December 31, 2018 as summarized by Table 1 of the study. Supporting analysis and calculations are provided within the study.

The study results set forth an annual depreciation expense of $553.8 million when applied to depreciable plant balances as of December 31, 2018. The results are summarized at the functional level as follows:

SUMMARY OF ORIGINAL COST, ACCRUAL RATES AND AMOUNTS

FUNCTION	ORIGINAL COST AS OF DECEMBER 31, 2018	PROPOSED RATE	PROPOSED EXPENSE
Steam Production Plant	$4,550,843,837.72	4.23	$192,375,575
Nuclear Production Plant	3,262,902,351.30	2.54	82,770,779
Hydraulic Production Plant	502,670,806.47	2.56	12,849,916
Other Production Plant	1,256,557,262.14	1.79	22,536,295
Transmission Plant	1,217,203,753.90	2.45	29,820,800
Distribution Plant	5,956,491,754.13	2.98	177,253,815
General Plant	646,964,530.85	5.60	36,201,049
Total	**$17,393,634,296.51**		**$553,808,229**

PART I. INTRODUCTION

AMEREN MISSOURI
DEPRECIATION STUDY

PART I. INTRODUCTION

SCOPE

This report sets forth the results of the depreciation study for Ameren Missouri ("Ameren"), to determine the annual depreciation accrual rates and amounts for book purposes applicable to the original cost of electric plant as of December 31, 2018. The rates and amounts are based on the straight line remaining life method of depreciation. This report also describes the concepts, methods and judgments which underlie the recommended annual depreciation accrual rates related to electric plant in service as of December 31, 2018.

The service life and net salvage estimates resulting from the study were based on informed judgment which incorporated analyses of historical plant retirement data as recorded through 2018, a review of Company practice and outlook as they relate to plant operation and retirement, and consideration of current practice in the electric industry, including knowledge of service lives and net salvage estimates used for other electric companies.

PLAN OF REPORT

Part I, Introduction, contains statements with respect to the plan of the report, and the basis of the study. Part II, Estimation of Survivor Curves, presents descriptions of the considerations and the methods used in the service life and net salvage studies. Part III, Service Life Considerations, presents the factors and judgment utilized in the average service life analysis. Part IV, Net Salvage Considerations, presents the judgment utilized for the net salvage study. Part V, Calculation of Annual and Accrued Depreciation, describes the procedures used in the calculation of group depreciation. Part VI, Results

of Study, presents summaries by depreciable group of annual depreciation accrual rates and amounts, as well as composite remaining lives. Part VII, Service Life Statistics presents the statistical analysis of service life estimates, Part VIII, Net Salvage Statistics sets forth the statistical indications of net salvage percents, and Part IX, Detailed Depreciation Calculations presents the detailed tabulations of annual depreciation.

BASIS OF THE STUDY

Depreciation

Depreciation, in public utility regulation, is the loss in service value not restored by current maintenance, incurred in connection with the consumption or prospective retirement of utility plant in the course of service from causes which are known to be in current operation and against which the utility is not protected by insurance. Among causes to be given consideration are wear and tear, deterioration, action of the elements, inadequacy, obsolescence, changes in the art, changes in demand, and the requirements of public authorities.

Depreciation, as used in accounting, is a method of distributing fixed capital costs, less net salvage, over a period of time by allocating annual amounts to expense. Each annual amount of such depreciation expense is part of that year's total cost of providing electric utility service. Normally, the period of time over which the fixed capital cost is allocated to the cost of service is equal to the period of time over which an item renders service, that is, the item's service life. The most prevalent method of allocation is to distribute an equal amount of cost to each year of service life. This method is known as the straight-line method of depreciation.

For most accounts, the annual depreciation was calculated by the straight line method using the average service life procedure and the remaining life basis. For certain General Plant accounts, the annual depreciation is based on amortization accounting.

Both types of calculations were based on original cost, attained ages, and estimates of service lives and net salvage.

The straight line method, average service life procedure is a commonly used depreciation calculation procedure that has been widely accepted in jurisdictions throughout North America. Gannett Fleming recommends its continued use. Amortization accounting is used for certain General Plant accounts because of the disproportionate plant accounting effort required when compared to the minimal original cost of the large number of items in these accounts. An explanation of the calculation of annual and accrued amortization is presented beginning on page V-4 of the report.

Service Life and Net Salvage Estimates

The service life and net salvage estimates used in the depreciation and amortization calculations were based on informed judgment which incorporated a review of management's plans, policies and outlook, a general knowledge of the electric utility industry, and comparisons of the service life and net salvage estimates from our studies of other electric utilities. The use of survivor curves to reflect the expected dispersion of retirement provides a consistent method of estimating depreciation for electric plant. Iowa type survivor curves were used to depict the estimated survivor curves for the plant accounts not subject to amortization accounting.

The procedure for estimating service lives consisted of compiling historical data for the plant accounts or depreciable groups, analyzing this history through the use of widely accepted techniques, and forecasting the survivor characteristics for each depreciable group on the basis of interpretations of the historical data analyses and the probable future. The combination of the historical experience and the estimated future yielded estimated survivor curves from which the average service lives were derived.

PART II. ESTIMATION OF SURVIVOR CURVES

PART II. ESTIMATION OF SURVIVOR CURVES

The calculation of annual depreciation based on the straight line method requires the estimation of survivor curves and the selection of group depreciation procedures. The estimation of survivor curves is discussed below and the development of net salvage is discussed in later sections of this report.

SURVIVOR CURVES

The use of an average service life for a property group implies that the various units in the group have different lives. Thus, the average life may be obtained by determining the separate lives of each of the units, or by constructing a survivor curve by plotting the number of units which survive at successive ages.

The survivor curve graphically depicts the amount of property existing at each age throughout the life of an original group. From the survivor curve, the average life of the group, the remaining life expectancy, the probable life, and the frequency curve can be calculated. In Figure 1, a typical smooth survivor curve and the derived curves are illustrated. The average life is obtained by calculating the area under the survivor curve, from age zero to the maximum age, and dividing this area by the ordinate at age zero. The remaining life expectancy at any age can be calculated by obtaining the area under the curve, from the observation age to the maximum age, and dividing this area by the percent surviving at the observation age. For example, in Figure 1, the remaining life at age 30 is equal to the crosshatched area under the survivor curve divided by 29.5 percent surviving at age 30. The probable life at any age is developed by adding the age and remaining life. If the probable life of the property is calculated for each year of age, the probable life curve shown in the chart can be developed. The frequency curve presents the number of units retired in each age interval. It is derived by obtaining the differences between the amount of property surviving at the beginning and at the end of each interval.

This study has incorporated the use of Iowa curves developed from a retirement rate analysis of historical retirement history. A discussion of the concepts of survivor curves and of the development of survivor curves using the retirement rate method is presented below.

Iowa Type Curves

The range of survivor characteristics usually experienced by utility and industrial properties is encompassed by a system of generalized survivor curves known as the Iowa type curves. There are four families in the Iowa system, labeled in accordance with the location of the modes of the retirements in relationship to the average life and the relative height of the modes. The left moded curves, presented in Figure 2, are those in which the greatest frequency of retirement occurs to the left of, or prior to, average service life. The symmetrical moded curves, presented in Figure 3, are those in which the greatest frequency of retirement occurs at average service life. The right moded curves, presented in Figure 4, are those in which the greatest frequency occurs to the right of, or after, average service life. The origin moded curves, presented in Figure 5, are those in which the greatest frequency of retirement occurs at the origin, or immediately after age zero. The letter designation of each family of curves (L, S, R or O) represents the location of the mode of the associated frequency curve with respect to the average service life. The numbers represent the relative heights of the modes of the frequency curves within each family.

The Iowa curves were developed at the Iowa State College Engineering Experiment Station through an extensive process of observation and classification of the ages at which industrial property had been retired. A report of the study which resulted in the classification of property survivor characteristics into 18 type curves,

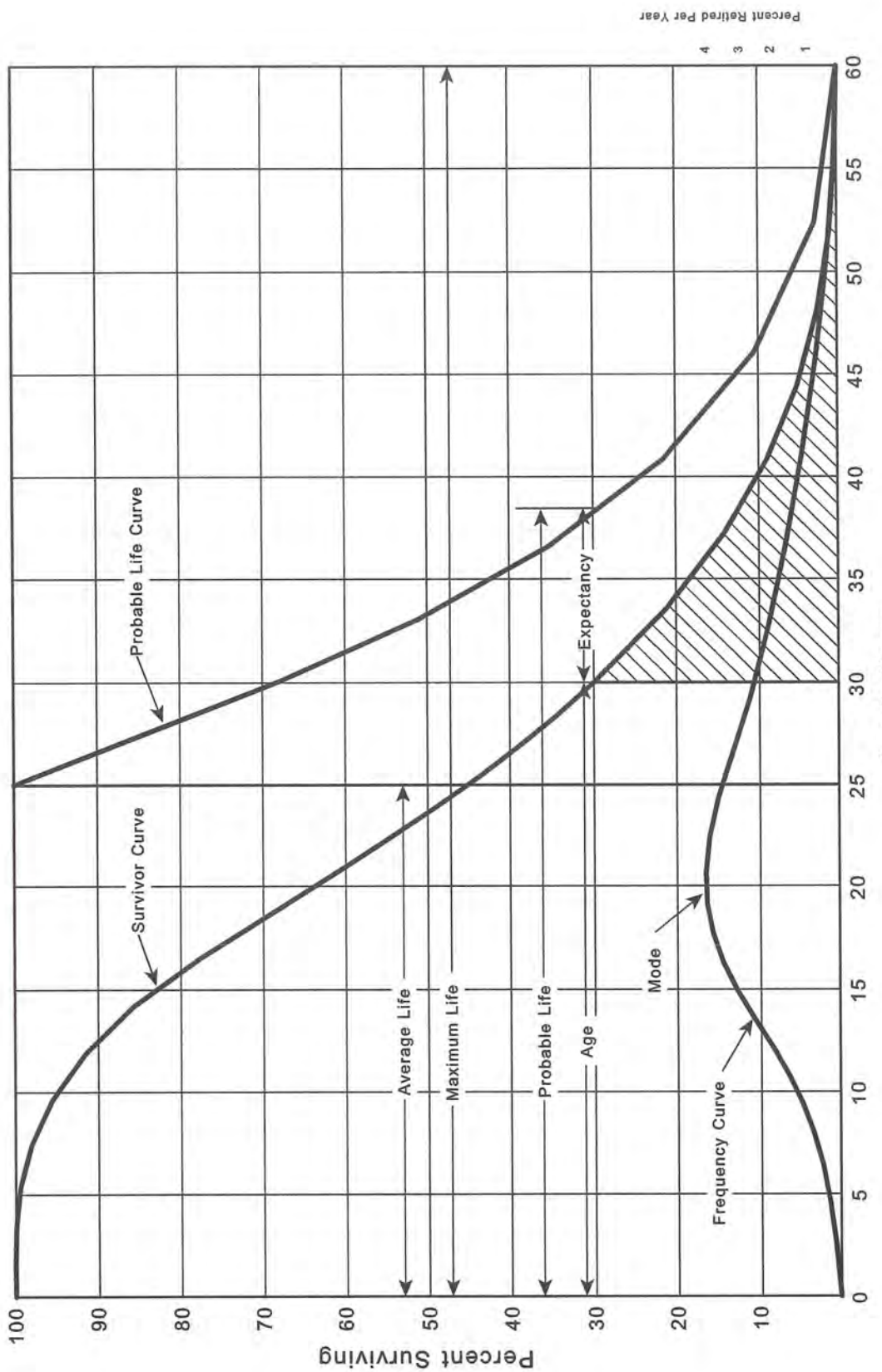


Figure 1. A Typical Survivor Curve and Derived Curves

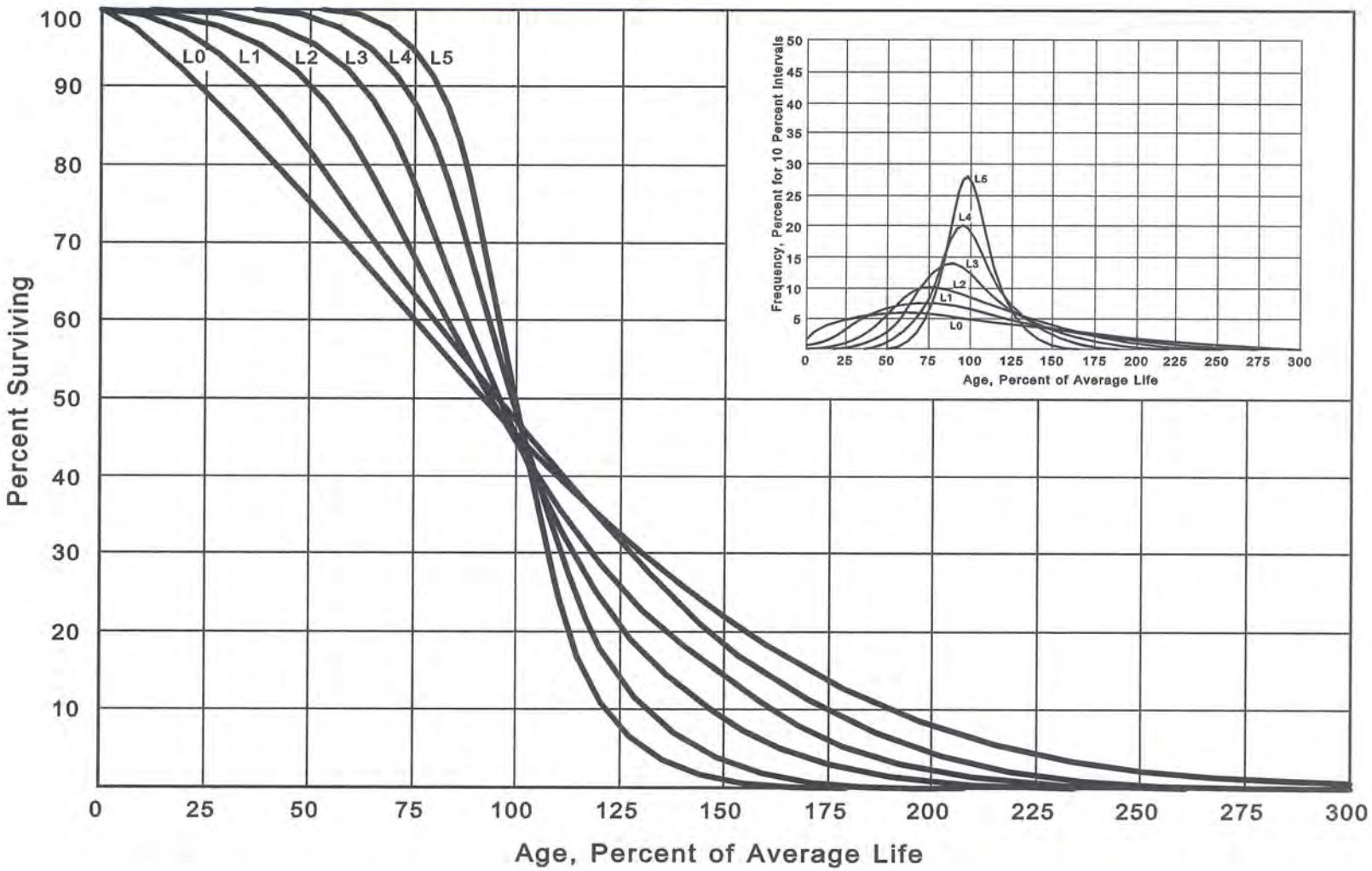


Figure 2. Left Modal or "L" Iowa Type Survivor Curves

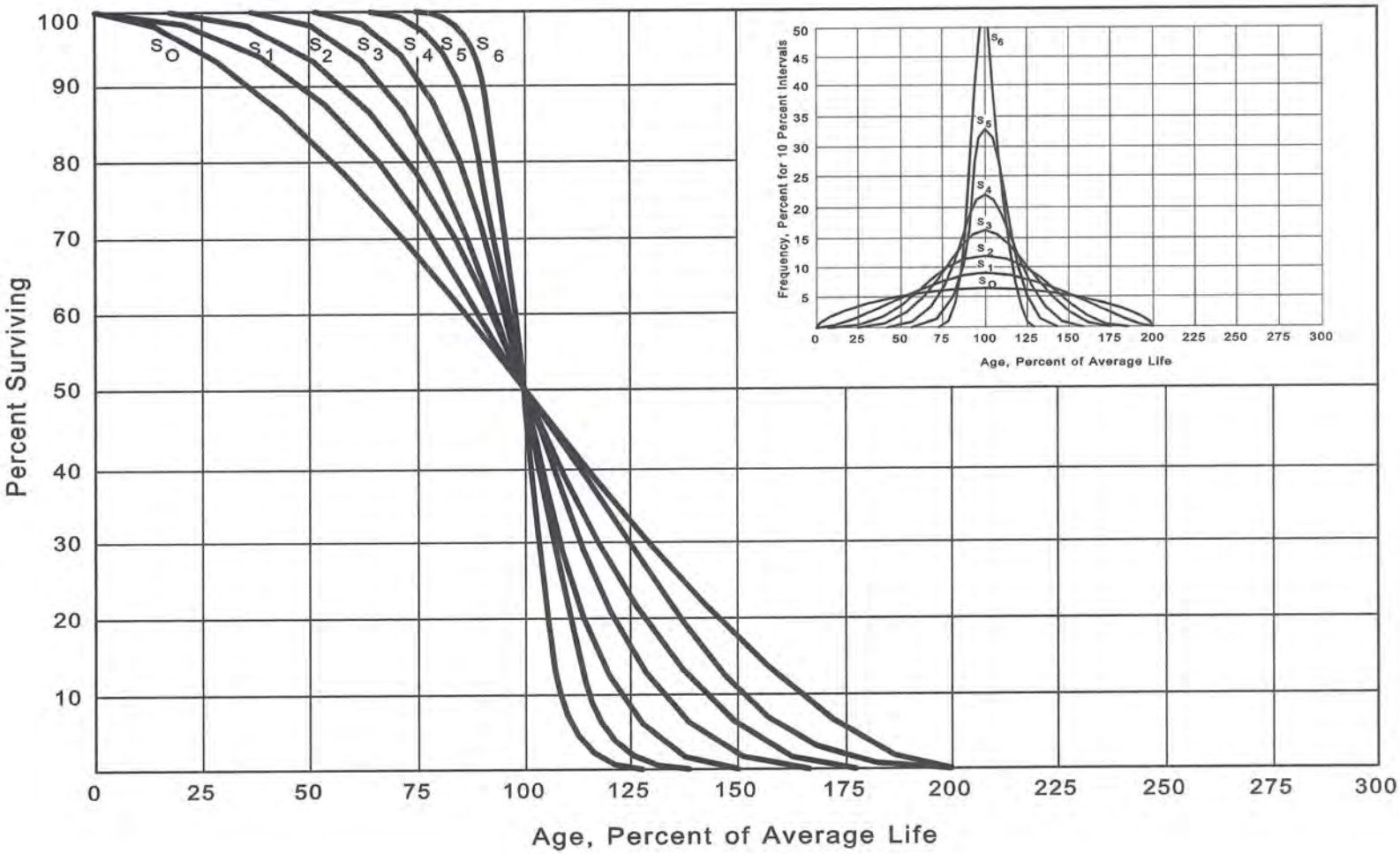


Figure 3. Symmetrical or "S" Iowa Type Survivor Curves

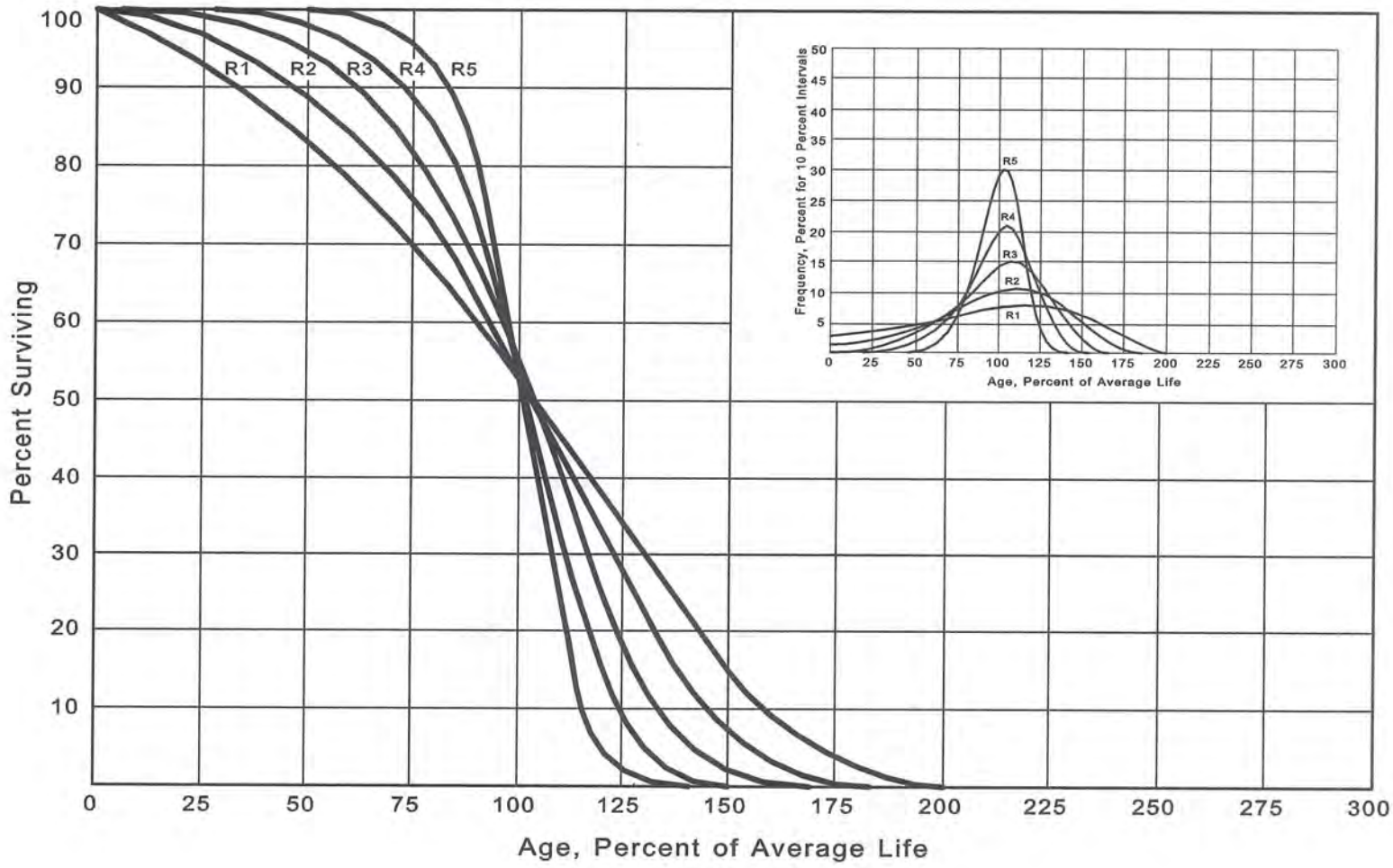


Figure 4. Right Modal or "R" Iowa Type Survivor Curves

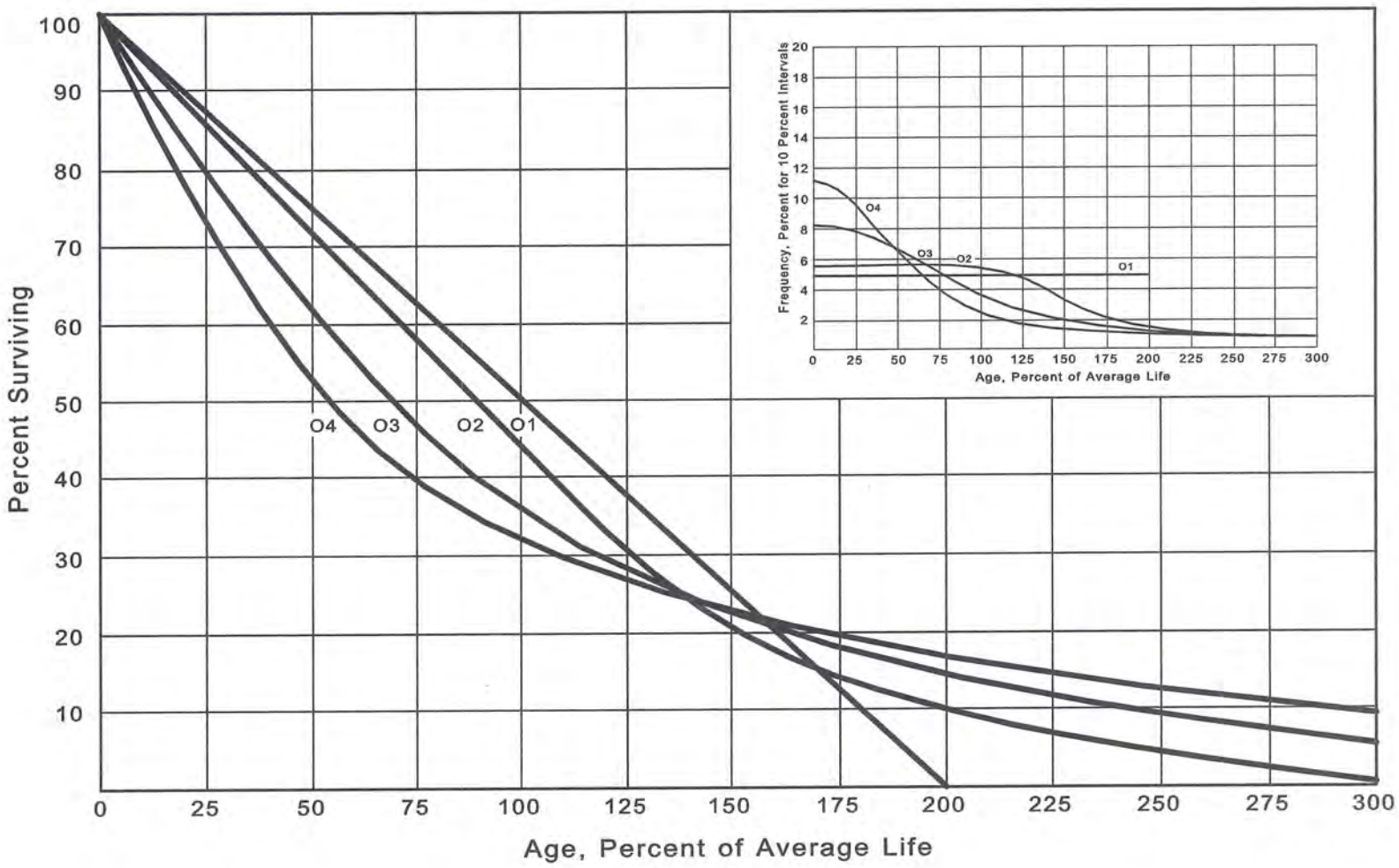


Figure 5. Origin Modal or "O" Iowa Type Survivor Curves

which constitute three of the four families, was published in 1935 in the form of the Experiment Station's Bulletin 125. These curve types have also been presented in subsequent Experiment Station bulletins and in the text, "Engineering Valuation and Depreciation."[1] In 1957, Frank V. B. Couch, Jr., an Iowa State College graduate student submitted a thesis presenting his development of the fourth family consisting of the four O type survivor curves.

Retirement Rate Method of Analysis

The retirement rate method is an actuarial method of deriving survivor curves using the average rates at which property of each age group is retired. The method relates to property groups for which aged accounting experience is available and is the method used to develop the original stub survivor curves in this study. The method (also known as the annual rate method) is illustrated through the use of an example in the following text, and is also explained in several publications, including "Statistical Analyses of Industrial Property Retirements,"[2] "Engineering Valuation and Depreciation,"[3] and "Depreciation Systems."[4]

The average rate of retirement used in the calculation of the percent surviving for the survivor curve (life table) requires two sets of data: first, the property retired during a period of observation, identified by the property's age at retirement; and second, the property exposed to retirement at the beginning of the age intervals during the same period. The period of observation is referred to as the experience band, and the band of years which represent the installation dates of the property exposed to retirement during the experience band is referred to as the placement band. An example of the calculations used in the development of a life table follows. The example includes schedules of annual

[1]Marston, Anson, Robley Winfrey and Jean C. Hempstead. Engineering Valuation and Depreciation, 2nd Edition. New York, McGraw-Hill Book Company. 1953.
[2]Winfrey, Robley, Statistical Analyses of Industrial Property Retirement. Iowa State College Engineering Station, Bulletin 125. 1935.
[3]Marston, Anson, Robley Winfrey, and Jean C. Hempstead, Supra Note 2.
[4]Wolf, Frank K. and W. Chester Fitch. Depreciation Systems. Iowa State University Press. 1994.

aged property transactions, a schedule of plant exposed to retirement, a life table and illustrations of smoothing the stub survivor curve.

Schedules of Annual Transactions in Plant Records

The property group used to illustrate the retirement rate method is observed for the experience band 2009-2018 during which there were placements during the years 2004-2018. In order to illustrate the summation of the aged data by age interval, the data were compiled in the manner presented in Schedules 1 and 2 on pages II-11 and II-12 In Schedule 1, the year of installation (year placed) and the year of retirement are shown. The age interval during which a retirement occurred is determined from this information. In the example which follows, $10,000 of the dollars invested in 2004 were retired in 2009. The $10,000 retirement occurred during the age interval between 4½ and 5½ years on the basis that approximately one-half of the amount of property was installed prior to and subsequent to July 1 of each year. That is, on the average, property installed during a year is placed in service at the midpoint of the year for the purpose of the analysis. All retirements also are stated as occurring at the midpoint of a
one-year age interval of time, except the first age interval which encompasses only one-half year.

The total retirements occurring in each age interval in a band are determined by summing the amounts for each transaction year-installation year combination for that age interval. For example, the total of $143,000 retired for age interval 4½-5½ is the sum of the retirements entered on Schedule 1 immediately above the stair step line drawn on the table beginning with the 2009 retirements of 2004 installations and ending with the 2018 retirements of the 2013 installations. Thus, the total amount of 143 for age interval 4½-5½ equals the sum of:

$$10 + 12 + 13 + 11 + 13 + 13 + 15 + 17 + 19 + 20.$$

SCHEDULE 1. RETIREMENTS FOR EACH YEAR 2009-2018
SUMMARIZED BY AGE INTERVAL

Experience Band 2009-2018

Placement Band 2004-2018

Year Placed	Retirements, Thousands of Dollars During Year										Total During Age Interval	Age Interval
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
2004	10	11	12	13	14	16	23	24	25	26	26	13½-14½
2005	11	12	13	15	16	18	20	21	22	19	44	12½-13½
2006	11	12	13	14	16	17	19	21	22	18	64	11½-12½
2007	8	9	10	11	11	13	14	15	16	17	83	10½-11½
2008	9	10	11	12	13	14	16	17	19	20	93	9½-10½
2009	4	9	10	11	12	13	14	15	16	20	105	8½-9½
2010		5	11	12	13	14	15	16	18	20	113	7½-8½
2011			6	12	13	15	16	17	19	19	124	6½-7½
2012				6	13	15	16	17	19	19	131	5½-6½
2013					7	14	16	17	19	20	143	4½-5½
2014						8	18	20	22	23	146	3½-4½
2015							9	20	22	25	150	2½-3½
2016								11	23	25	151	1½-2½
2017									11	24	153	½-1½
2018										13	80	0-½
Total	53	68	86	106	128	157	196	231	273	308	1,606	

SCHEDULE 2. OTHER TRANSACTIONS FOR EACH YEAR 2009-2018
SUMMARIZED BY AGE INTERVAL

Experience Band 2009-2018

Placement Band 2004-2018

Year Placed	Acquisitions, Transfers and Sales, Thousands of Dollars During Year										Total During Age Interval	Age Interval
	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
2004	-	-	-	-	-	-	60[a]	-	-	-	-	13½-14½
2005	-	-	-	-	-	-	-	-	-	-	-	12½-13½
2006	-	-	-	-	-	-	-	-	-	-	-	11½-12½
2007	-	-	-	-	-	-	-	(5)[b]	-	-	60	10½-11½
2008	-	-	-	-	-	-	-	6[a]	-	-	-	9½-10½
2009	-	-	-	-	-	-	-	-	-	-	(5)	8½-9½
2010		-	-	-	-	-	-	-	-	-	6	7½-8½
2011			-	-	-	-	-	-	-	-	-	6½-7½
2012				-	-	-	-	(12)[b]	-	-	-	5½-6½
2013					-	-	-	-	22[a]	-	-	4½-5½
2014						-	-	(19)[b]	-	-	10	3½-4½
2015							-	-	-	-	-	2½-3½
2016								-	-	(102)[c]	(121)	1½-2½
2017									-	-	-	½-1½
2018											-	0-½
Total	-	-	-	-	-	-	60	(30)	22	(102)	(50)	

[a] Transfer Affecting Exposures at Beginning of Year

[b] Transfer Affecting Exposures at End of Year

[c] Sale with Continued Use

Parentheses Denote Credit Amount.

In Schedule 2, other transactions which affect the group are recorded in a similar manner. The entries illustrated include transfers and sales. The entries which are credits to the plant account are shown in parentheses. The items recorded on this schedule are not totaled with the retirements, but are used in developing the exposures at the beginning of each age interval.

Schedule of Plant Exposed to Retirement

The development of the amount of plant exposed to retirement at the beginning of each age interval is illustrated in Schedule 3 on page II-14. The surviving plant at the beginning of each year from 2009 through 2018 is recorded by year in the portion of the table headed "Annual Survivors at the Beginning of the Year." The last amount entered in each column is the amount of new plant added to the group during the year. The amounts entered in Schedule 3 for each successive year following the beginning balance or addition are obtained by adding or subtracting the net entries shown on Schedules 1 and 2. For the purpose of determining the plant exposed to retirement, transfers-in are considered as being exposed to retirement in this group at the beginning of the year in which they occurred, and the sales and transfers-out are considered to be removed from the plant exposed to retirement at the beginning of the following year. Thus, the amounts of plant shown at the beginning of each year are the amounts of plant from each placement year considered to be exposed to retirement at the beginning of each successive transaction year. For example, the exposures for the installation year 2014 are calculated in the following manner:

Exposures at age 0	= amount of addition	= $750,000
Exposures at age ½	= $750,000 - $ 8,000	= $742,000
Exposures at age 1½	= $742,000 - $18,000	= $724,000
Exposures at age 2½	= $724,000 - $20,000 - $19,000	= $685,000
Exposures at age 3½	= $685,000 - $22,000	= $663,000

SCHEDULE 3. PLANT EXPOSED TO RETIREMENT
JANUARY 1 OF EACH YEAR 2009-2018
SUMMARIZED BY AGE INTERVAL

Experience Band 2009-2018

Placement Band 2004-2018

Year Placed	Exposures, Thousands of Dollars Annual Survivors at the Beginning of the Year 2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total at Beginning of Age Interval	Age Interval
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
2004	255	245	234	222	209	195	239	216	192	167	167	13½-14½
2005	279	268	256	243	228	212	194	174	153	131	323	12½-13½
2006	307	296	284	271	257	241	224	205	184	162	531	11½-12½
2007	338	330	321	311	300	289	276	262	242	226	823	10½-11½
2008	376	367	357	346	334	321	307	297	280	261	1,097	9½-10½
2009	420[a]	416	407	397	386	374	361	347	332	316	1,503	8½-9½
2010		460[a]	455	444	432	419	405	390	374	356	1,952	7½-8½
2011			510[a]	504	492	479	464	448	431	412	2,463	6½-7½
2012				580[a]	574	561	546	530	501	482	3,057	5½-6½
2013					660[a]	653	639	623	628	609	3,789	4½-5½
2014						750[a]	742	724	685	663	4,332	3½-4½
2015							850[a]	841	821	799	4,955	2½-3½
2016								960[a]	949	926	5,719	1½-2½
2017									1,080[a]	1,069	6,579	½-1½
2018										1,220[a]	7,490	0-½
Total	1,975	2,382	2,824	3,318	3,872	4,494	5,247	6,017	6,852	7,799	44,780	

[a]Additions during the year

For the entire experience band 2009-2018, the total exposures at the beginning of an age interval are obtained by summing diagonally in a manner similar to the summing of the retirements during an age interval (Schedule 1). For example, the figure of 3,789, shown as the total exposures at the beginning of age interval 4½-5½, is obtained by summing:

255 + 268 + 284 + 311 + 334 + 374 + 405 + 448 + 501 + 609.

Original Life Table

The original life table, illustrated in Schedule 4 on page II-16, is developed from the totals shown on the schedules of retirements and exposures, Schedules 1 and 3, respectively. The exposures at the beginning of the age interval are obtained from the corresponding age interval of the exposure schedule, and the retirements during the age interval are obtained from the corresponding age interval of the retirement schedule. The retirement ratio is the result of dividing the retirements during the age interval by the exposures at the beginning of the age interval. The percent surviving at the beginning of each age interval is derived from survivor ratios, each of which equals one minus the retirement ratio. The percent surviving is developed by starting with 100% at age zero and successively multiplying the percent surviving at the beginning of each interval by the survivor ratio, i.e., one minus the retirement ratio for that age interval. The calculations necessary to determine the percent surviving at age 5½ are as follows:

Percent surviving at age 4½	=	88.15				
Exposures at age 4½	=	3,789,000				
Retirements from age 4½ to 5½	=	143,000				
Retirement Ratio	=	143,000	÷	3,789,000	=	0.0377
Survivor Ratio	=	1.000	-	0.0377	=	0.9623
Percent surviving at age 5½	=	(88.15)	x	(0.9623)	=	84.83

The totals of the exposures and retirements (columns 2 and 3) are shown for the purpose of checking with the respective totals in Schedules 1 and 3. The ratio of the total retirements to the total exposures, other than for each age interval, is meaningless.

SCHEDULE 4. ORIGINAL LIFE TABLE
CALCULATED BY THE RETIREMENT RATE METHOD

Experience Band 2009-2018 Placement Band 2004-2018

(Exposure and Retirement Amounts are in Thousands of Dollars)

Age at Beginning of Interval	Exposures at Beginning of Age Interval	Retirements During Age Interval	Retirement Ratio	Survivor Ratio	Percent Surviving at Beginning of Age Interval
(1)	(2)	(3)	(4)	(5)	(6)
0.0	7,490	80	0.0107	0.9893	100.00
0.5	6,579	153	0.0233	0.9767	98.93
1.5	5,719	151	0.0264	0.9736	96.62
2.5	4,955	150	0.0303	0.9697	94.07
3.5	4,332	146	0.0337	0.9663	91.22
4.5	3,789	143	0.0377	0.9623	88.15
5.5	3,057	131	0.0429	0.9571	84.83
6.5	2,463	124	0.0503	0.9497	81.19
7.5	1,952	113	0.0579	0.9421	77.11
8.5	1,503	105	0.0699	0.9301	72.65
9.5	1,097	93	0.0848	0.9152	67.57
10.5	823	83	0.1009	0.8991	61.84
11.5	531	64	0.1205	0.8795	55.60
12.5	323	44	0.1362	0.8638	48.90
13.5	167	26	0.1557	0.8443	42.24
					35.66
Total	44,780	1,606			

Column 2 from Schedule 3, Column 12, Plant Exposed to Retirement.
Column 3 from Schedule 1, Column 12, Retirements for Each Year.
Column 4 = Column 3 Divided by Column 2.
Column 5 = 1.0000 Minus Column 4.
Column 6 = Column 5 Multiplied by Column 6 as of the Preceding Age Interval.

The original survivor curve is plotted from the original life table (column 6, Schedule 4). When the curve terminates at a percent surviving greater than zero, it is called a stub survivor curve. Survivor curves developed from retirement rate studies generally are stub curves.

Smoothing the Original Survivor Curve

The smoothing of the original survivor curve eliminates any irregularities and serves as the basis for the preliminary extrapolation to zero percent surviving of the original stub curve. Even if the original survivor curve is complete from 100% to zero percent, it is desirable to eliminate any irregularities, as there is still an extrapolation for the vintages which have not yet lived to the age at which the curve reaches zero percent. In this study, the smoothing of the original curve with established type curves was used to eliminate irregularities in the original curve.

The Iowa type curves are used in this study to smooth those original stub curves which are expressed as percents surviving at ages in years. Each original survivor curve was compared to the Iowa curves using visual and mathematical matching in order to determine the better fitting smooth curves. In Figures 6, 7, and 8, the original curve developed in Schedule 4 is compared with the L, S, and R Iowa type curves which most nearly fit the original survivor curve. In Figure 6, the L1 curve with an average life between 12 and 13 years appears to be the best fit. In Figure 7, the S0 type curve with a 12-year average life appears to be the best fit and appears to be better than the L1 fitting. In Figure 8, the R1 type curve with a 12-year average life appears to be the best fit and appears to be better than either the L1 or the S0.

In Figure 9, the three fittings, 12-L1, 12-S0 and 12-R1 are drawn for comparison purposes. It is probable that the 12-R1 Iowa curve would be selected as the most representative of the plotted survivor characteristics of the group.

FIGURE 6. ILLUSTRATION OF THE MATCHING OF AN ORIGINAL SURVIVOR CURVE WITH AN L1 IOWA TYPE CURVE
ORIGINAL AND SMOOTH SURVIVOR CURVES

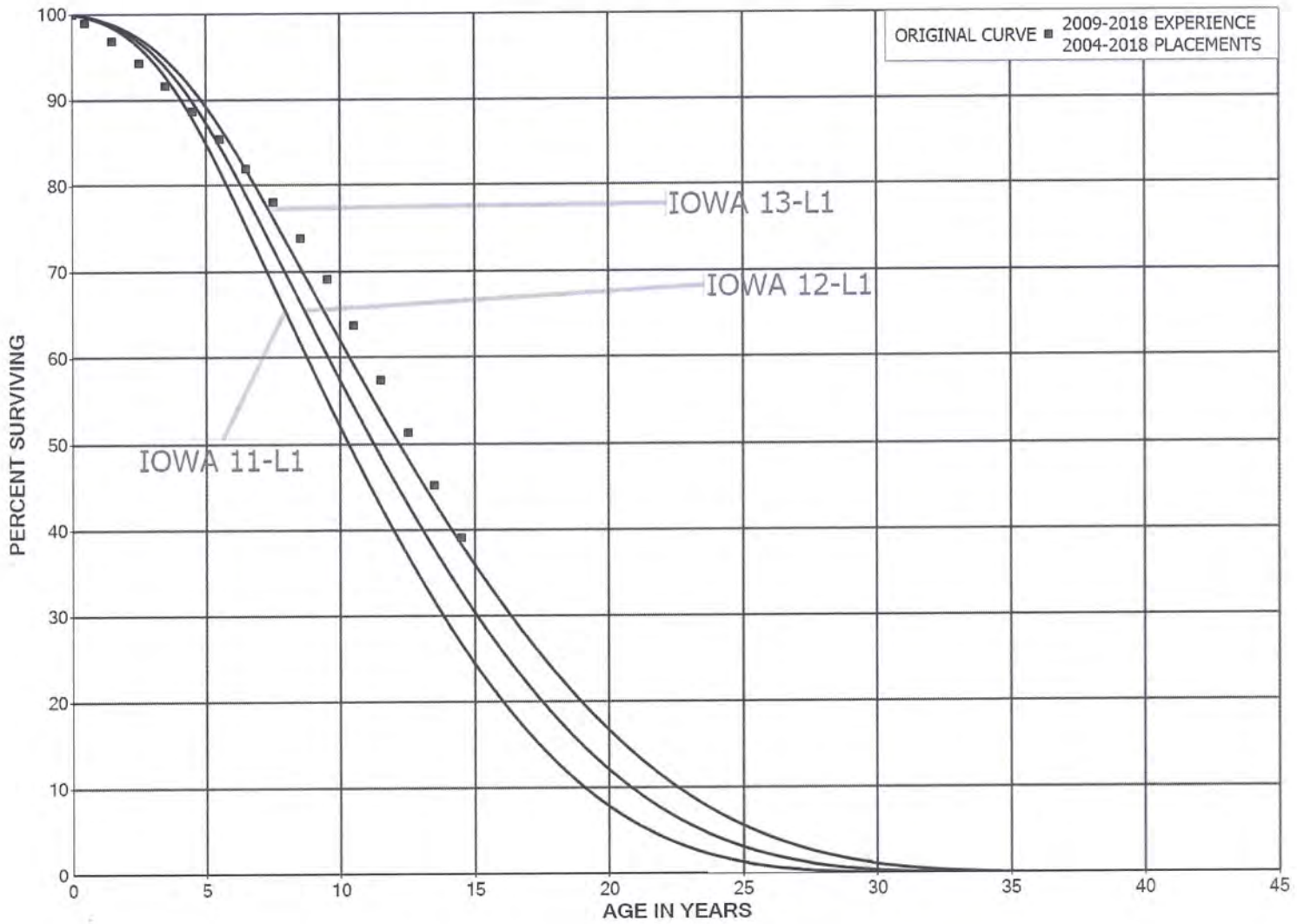


FIGURE 7. ILLUSTRATION OF THE MATCHING OF AN ORIGINAL SURVIVOR CURVE WITH AN S0 IOWA TYPE CURVE
ORIGINAL AND SMOOTH SURVIVOR CURVES

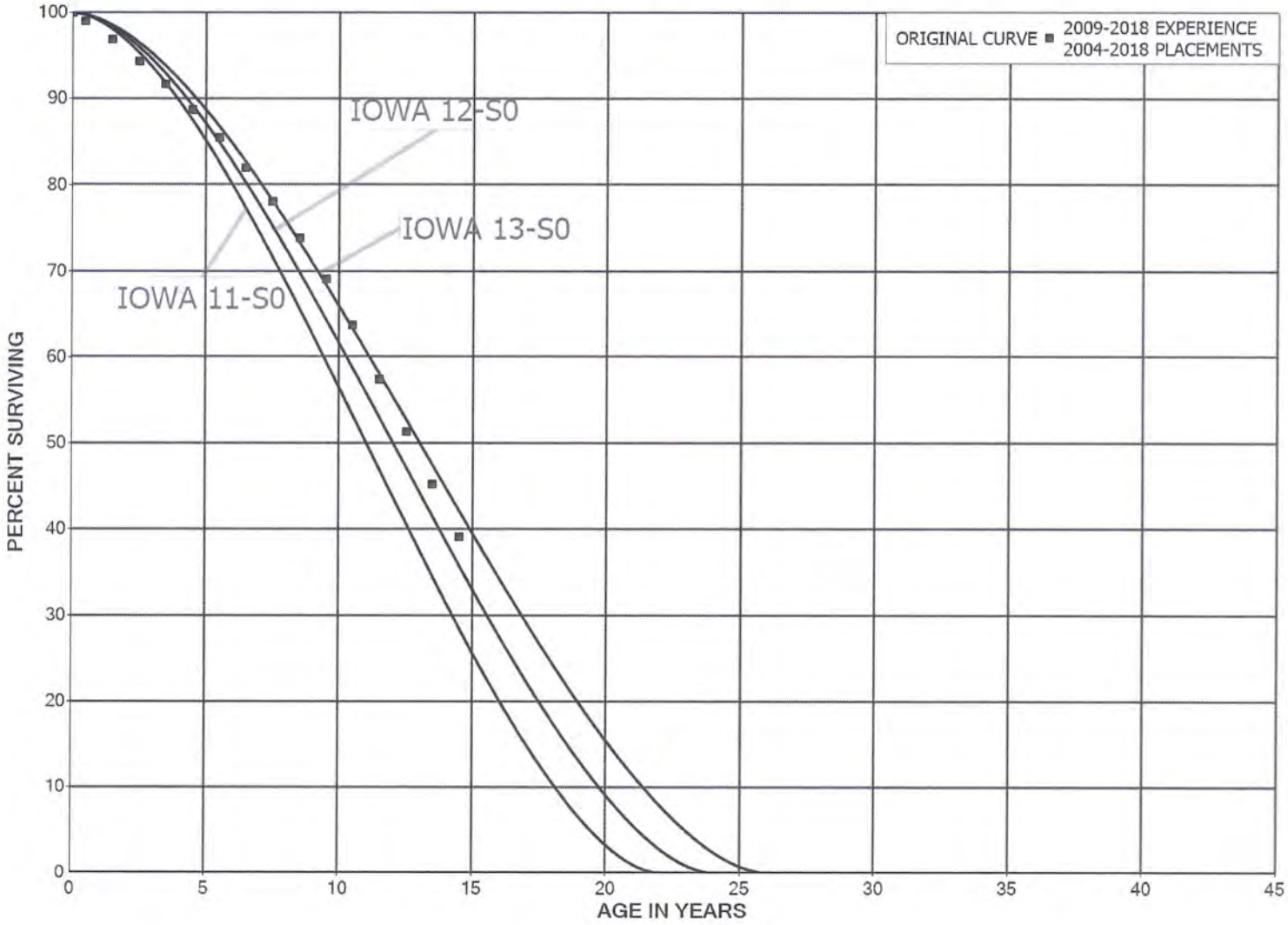


FIGURE 8. ILLUSTRATION OF THE MATCHING OF AN ORIGINAL SURVIVOR CURVE WITH AN R1 IOWA TYPE CURVE
ORIGINAL AND SMOOTH SURVIVOR CURVES

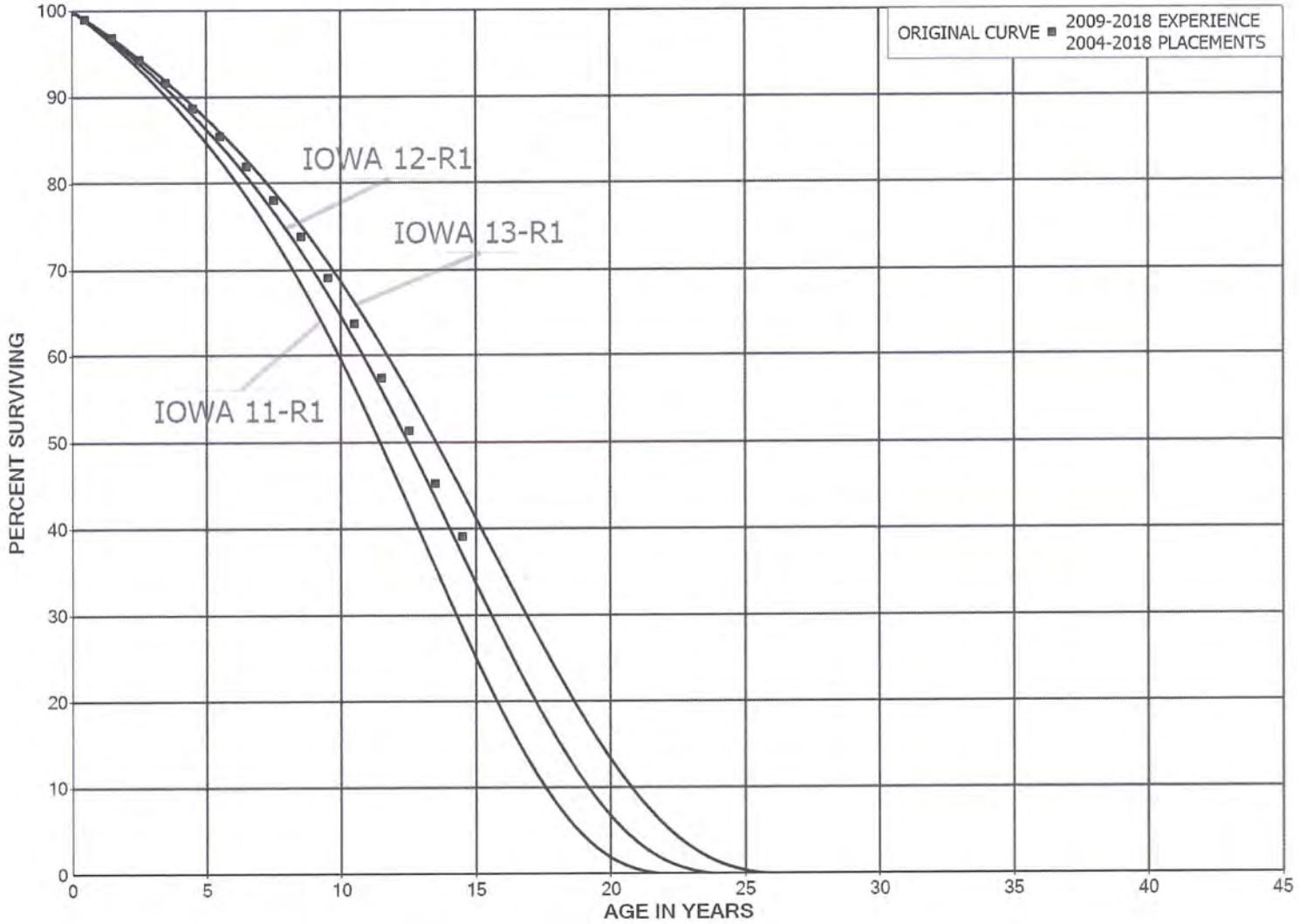
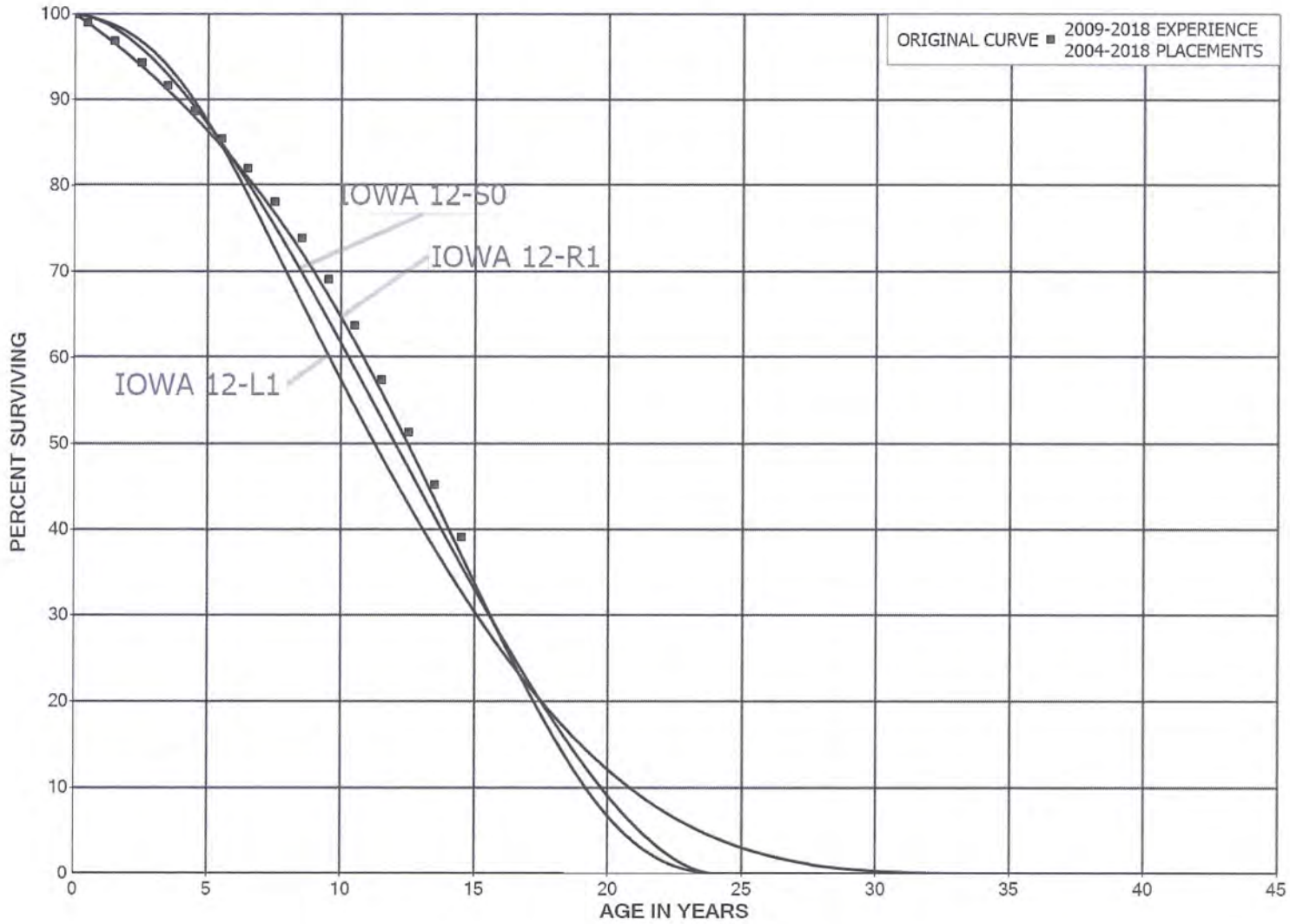


FIGURE 9. ILLUSTRATION OF THE MATCHING OF AN ORIGINAL SURVIVOR CURVE WITH AN L1, S0 AND R1 IOWA TYPE CURVE
ORIGINAL AND SMOOTH SURVIVOR CURVES



PART III. SERVICE LIFE CONSIDERATIONS

PART III. SERVICE LIFE CONSIDERATIONS

FIELD TRIPS

In order to be familiar with the operation of the Company and observe representative portions of the plant, a field trip was conducted for the study. A general understanding of the function of the plant and information with respect to the reasons for past retirements and the expected future causes of retirements are obtained during field trips. This knowledge and information were incorporated in the interpretation and extrapolation of the statistical analyses.

The following is a list of the locations visited during the most recent field trips.

April 15, 2019
- Taum Sauk Pump Storage Plant
- North Farmington Substation
- Leadington Substation
- St. Francis Service Center
- Maryland Heights Landfill Gas Plant

March 10-13, 2014
- Dorsett Operations Center
- Sioux Generating Plant
- Rush Island Generating Plant
- Rush Island Substation
- Meramec Generating Plant
- Labadie Generating Plant
- Venice CT Plant
- Venice Steam Generating Plant
- Central Substation
- Russell Substation

December 13-14, 2001
- Labadie Generating Plant
- Meramec Generating Plant
- Rush Island Generating Plant
- Corporate Headquarters Building
- Venice Steam Generating Plant
- Sioux Generating Plant
- Choteau Substation
- Jefferson City Office

SERVICE LIFE ANALYSIS

The service life estimates were based on informed judgment which considered a number of factors. The primary factors were the statistical analyses of data; current Company policies and outlook as determined during conversations with management; and the survivor curve estimates from previous studies of this company and other electric companies.

For many of the plant accounts and subaccounts for which survivor curves were estimated, the statistical analyses using the retirement rate method resulted in good to excellent indications of the survivor patterns experienced. These accounts represent 83 percent of depreciable plant. Generally, the information external to the statistics led to no significant departure from the indicated survivor curves for the accounts listed below. The statistical support for the service life estimates is presented in the section beginning on page VII-2.

Account No.	Account Description
STEAM PRODUCTION PLANT	
311	Structures and Improvements
312	Boiler Plant Equipment
314	Turbogenerator Units
315	Accessory Electric Equipment
316	Miscellaneous Power Plant Equipment
NUCLEAR PRODUCTION PLANT	
321	Structures and Improvements
322	Reactor Plant Equipment
323	Turbogenerator Units
324	Accessory Electric Equipment
325	Miscellaneous Power Plant Equipment
HYDRAULIC PRODUCTION PLANT	
331	Structures and Improvements
333	Water Wheels, Turbines and Generators
334	Accessory Electric Equipment
335	Miscellaneous Power Plant Equipment
OTHER PRODUCTION PLANT	
341	Structures and Improvements
342	Fuel Holders, Producers, and Accessories

344	Generators - Other CTs
345	Accessory Electric Equipment
346	Miscellaneous Power Plant Equipment
TRANSMISSION PLANT	
353	Station Equipment
355	Poles and Fixtures
DISTRIBUTION PLANT	
361	Structures and Improvements
362	Station Equipment
364	Poles and Fixtures
367	Underground Conductors and Devices
368	Line Transformers
369.1	Overhead Services
370	Meters
371	Installations on Customers' Premises
GENERAL PLANT	
390	Structures and Improvements - Large Structures
390	Structures and Improvements - Miscellaneous Structures - Old
392	Transportation Equipment
396	Power Operated Equipment

Account 364, Poles and Fixtures, is used to illustrate the manner in which the study was conducted for most of the accounts. Aged retirement and other plant accounting data were compiled through the year 2018. These data were coded in the course of the Company's normal recordkeeping according to plant account or property group, type of transaction, year in which the transaction took place, and year in which the electric plant was placed in service. The data were analyzed by the retirement rate method of life analysis. The survivor curve chart for the account is presented on page VII-160 and the life tables for the experience bands plotted on the chart follow it.

The company has a pole inspection program in place in which all poles are to be tested every twelve years. Poles are sonically tested and borings inspected to assess the condition of the poles. Poles showing signs of advanced rot and decay are removed

while other poles in better condition can be mitigated before the pole is significantly weakened. Most poles that fail an inspection are replaced. The historical service life indication for Account 364, Poles and Fixtures is the 50-R2.5 based on the 1922 to 2018 and 1989 to 2018 experience band. The prior survivor curve estimate for Account 364, Poles and Fixtures was the 47-R2.5. Typical service lives for poles and fixtures of other electric companies in the Midwest range from 40 to 60 years. The Iowa 50-R2.5 survivor curve reflects the outlook of management, is within the range of service life estimates used by other electric companies and is a reasonable interpretation of the significant portion of the stub survivor curves, particularly through about age 55.

For Account 365, Overhead Conductors and Devices, the estimate of survivor characteristics is based on the 1922 to 2018 and 1989 to 2018 experience band. Most retirements have been due to deterioration, inadequacy and voltage conversions. Typical service lives for overhead conductors and devices range from 40 to 60 years. The Iowa 50-R1 survivor curve is within the range of other estimates, is a reasonable interpretation of the significant portions of the survivor curves, particularly through about age 50, and reflects the outlook of management.

Similar studies were performed for the remaining plant accounts. Each of the judgments represented a consideration of statistical analyses of aged plant activity, management's outlook for the future, and the typical range of lives used by other electric companies.

The selected amortization periods for other General Plant accounts are described in the section "Calculated Annual and Accrued Amortization."

Life Span Estimates

The life span method was used for the Company's production plant accounts, excluding combustion turbines. The life span method is appropriate for these accounts since all of the assets within the plant will be retired concurrently. Probable retirement dates were estimated for each power plant. Life spans for each Steam Production Plant were estimated based on discussions with management regarding future outlook, age and condition of the plant, life spans typically experienced and estimated for similar plants. The life span estimates are the same as those currently used for each facility, which incorporated a comprehensive study of individual plants conducted by Black and Veatch. For coal-fired generation, the factors influencing the outlook for generating facilities has evolved in recent years and many facilities across the country either have been or are planned to be retired. As the Company reviews the outlook for these facilities, there may be a need to revise life span estimates in future studies. The life span and probable retirement dates used for steam production plants are as follows:

Plant	In-Service Date	Probable Retirement Date	Life Span
Meramac	1953,1954,1959,1961	2022	69,68,63,61
Sioux	1967,1968	2033	66,65
Labadie	1970,1971,1972,1973	2042	72,71,70,69
Rush Island	1976,1977	2045	69,68

Power plants typically are retired when there are other units that can generate electricity at a lower cost. Typical life spans for base load, coal-fired power plants are 50 to 65 years, although more have experienced shorter life spans in recent years. For example, Units 1 and 2 at Rush Island were completed in 1976 and 1977, respectively. The estimated probable retirement date for Rush Island is September 30, 2045. Thus, the

life spans estimated for the Rush Island power plant are 68 years for Unit 2 and 69 years for Unit 1, which is beyond the upper end of the typical range. The estimated retirement dates should not be interpreted as commitments to retire these plants on these dates, but rather, as reasonable estimates subject to modification in the future as circumstances dictate.

The life span for the Callaway Nuclear Power Plant is based on the length of the operating license as established by the Nuclear Regulatory Commission (NRC). The probable retirement date estimated for the Callaway Nuclear Plant is October 2044, 20 years subsequent to the expiration of the original operating license. The resulting life span estimated for Callaway is slightly less than 60 years since the units did not begin commercial operation until several months after the original operating license was issued.

For most production accounts, an interim survivor curve was estimated for each account, since interim retirements, i.e., retirements prior to the final retirement, are experienced in such accounts.

PART IV. NET SALVAGE CONSIDERATIONS

PART IV. NET SALVAGE CONSIDERATIONS

NET SALVAGE ANALYSIS

The estimates of net salvage by account were based in part on historical data compiled for the years 1961 through 2018. Cost of removal and salvage were expressed as percents of the original cost of plant retired, both on annual and three-year moving average bases. The most recent five-year average also was calculated for consideration. The net salvage estimates by account are expressed as a percent of the original cost of plant retired.

Net Salvage Considerations

The estimates of future net salvage are expressed as percentages of surviving plant in service, i.e., all future retirements. In cases in which removal costs are expected to exceed salvage receipts, a negative net salvage percentage is estimated. The net salvage estimates were based on judgment which incorporated analyses of historical cost of removal and salvage data, expectations with respect to future removal requirements and markets for retired equipment and materials.

The analyses of historical cost of removal and salvage data are presented in the section titled "Net Salvage Statistics" for the plant accounts for which the net salvage estimate relied partially on those analyses.

Statistical analyses of historical data for the period 1961 through 2018 contributed significantly toward the net salvage estimates for 36 plant accounts, representing 90 percent of the depreciable plant, as follows:

STEAM PRODUCTION PLANT

311.00	Structures and Improvements
312.00	Boiler Plant Equipment
314.00	Turbogenerator Units
315.00	Accessory Electric Equipment
316.00	Miscellaneous Power Plant Equipment

NUCLEAR PRODUCTION PLANT

321.00	Structures and Improvements
322.00	Reactor Plant Equipment
323.00	Turbogenerator Units
324.00	Accessory Electric Equipment
325.00	Miscellaneous Power Plant Equipment

HYDRAULIC PRODUCTION PLANT

331.00	Structures and Improvements
332.00	Reservoirs, Dams and Waterways
333.00	Water Wheels, Turbines and Generators
335.00	Miscellaneous Power Plant Equipment

OTHER PRODUCTION PLANT

341.00	Structures and Improvements
342.00	Fuel Holders, Producers and Accessories
344.00	Generators – Other CTs
345.00	Accessory Electric Equipment
346.00	Miscellaneous Power Plant Equipment

TRANSMISSION PLANT

352.00	Structures and Improvements
353.00	Station Equipment
354.00	Towers and Fixtures
356.00	Overhead Conductors and Devices

DISTRIBUTION PLANT

361.00	Structures and Improvements
362.00	Station Equipment
364.00	Poles and Fixtures
365.00	Overhead Conductors and Devices
367.00	Underground Conductors and Devices
368.00	Line Transformers
369.10	Overhead Services
369.20	Underground Services
370.00	Meters
371.00	Installations on Customers' Premises
373.00	Street Lighting and Signal Systems

GENERAL PLANT

392.00	Transportation Equipment
396.00	Power Operated Equipment

Account 365, Overhead Conductors and Devices will be used to illustrate the manner in which the study was conducted for most mass plant accounts. Net salvage data were compiled for the years 1961 through 2018. These data include the retirements,

cost of removal and gross salvage. Discussions with management indicated that retired overhead conductors are either reused or sold for scrap. However, there are typical costs to remove conductors that exceed any scrap value. The previous estimate of net salvage for overhead conductors was negative 50 percent. The range of typical net salvage estimates used by other electric companies for overhead conductors is negative 20 percent to negative 100 percent.

The net salvage estimate for this account is negative 50 percent and is based in part on the overall indicators and the trends in the cost of removal and salvage percents. Cost of removal as a percent of the original cost retired increased from the 1960's level of 40 percent to approximately 110 percent in the mid 2000's but has declined more recently to around 60 percent. In contrast, gross salvage has decreased from a level of 40 percent to approximately 15 percent in the 1990s, before moving back above 25 percent in the mid 2000's then declining most recently to around 5 percent. The 2003 to 2008 period was when scrap metal prices were at near record highs, a trend which has since moderated. The net salvage estimate of negative 50 percent is consistent with the overall net salvage percent of negative 52 percent experienced during the period 1961-2018. The most recent five year average for net salvage is also negative 52 percent.

The net salvage estimates for most of the remaining accounts were estimated using the above-described judgment process incorporating historical indications and reviewing the typical range of estimates used by other electric companies. The results of the net salvage analysis for each plant account are presented in account sequence beginning in the section titled "Net Salvage Statistics", page VIII-2.

The net salvage estimates for production plant are based on analyses of interim net salvage as it relates to interim retirements. Final or terminal net salvage amounts

related to decommissioning and dismantlement of existing electricity generating stations are not included in this study. The decision to exclude terminal net salvage was made by Ameren's management based on their desire to exclude this issue at this time. In prior cases, the Missouri Public Service Commission has ruled against the prospective recovery of final net salvage related to steam, hydraulic and other production, which defers the recovery of these costs to future customers. Final net salvage related to nuclear production is recovered in a separate nuclear decommissioning trust fund in accordance with NRC regulations.

Net salvage indications of interim net salvage as related to interim retirements were adjusted due to the fact that interim retirements only represent a portion of the total retirements experienced for each production plant account yet the net salvage estimate is applied to the entire plant balance. For example, if interim retirements are expected to comprise 24 percent of the total retirements experienced by Account 314 Turbogenerators at the Labadie Plant, then the historical net salvage indication of negative 10 percent would be adjusted 76 percent to negative 2 percent. The resulting net salvage estimates were adjusted using the interim survivor curve and probable retirement dates to reflect the percentage of plant in service that will experience interim retirements.

Generally, the net salvage estimates for the general plant amortization accounts were zero percent, consistent with amortization accounting.

PART V. CALCULATION OF ANNUAL AND ACCRUED DEPRECIATION

PART V. CALCULATION OF ANNUAL AND ACCRUED DEPRECIATION

GROUP DEPRECIATION PROCEDURES

A group procedure for depreciation is appropriate when considering more than a single item of property. Normally the items within a group do not have identical service lives, but have lives that are dispersed over a range of time. There are two primary group procedures, namely, average service life and equal life group. In the average service life procedure, the rate of annual depreciation is based on the average life or average remaining life of the group, and this rate is applied to the surviving balances of the group's cost. A characteristic of this procedure is that the cost of plant retired prior to average life is not fully recouped at the time of retirement, whereas the cost of plant retired subsequent to average life is more than fully recouped. Over the entire life cycle, the portion of cost not recouped prior to average life is balanced by the cost recouped subsequent to average life.

Single Unit of Property

The calculation of straight line depreciation for a single unit of property is straightforward. For example, if a $1,000 unit of property attains an age of four years and has a life expectancy of six years, the annual accrual over the total life is:

$$\frac{\$1{,}000}{(4 + 6)} = \$100 \text{ per year.}$$

The accrued depreciation is:

$$\$1{,}000\left(1 - \frac{6}{10}\right) = \$400.$$

Remaining Life Annual Accruals

For the purpose of calculating remaining life accruals as of December 31, 2018, the depreciation reserve for each plant account is allocated among vintages in proportion to the calculated accrued depreciation for the account. Explanations of remaining life accruals and calculated accrued depreciation follow. The detailed calculations as of December 31, 2018, are set forth in the Results of Study section of the report.

Average Service Life Procedure

In the average service life procedure, the remaining life annual accrual for each vintage is determined by dividing future book accruals (original cost less book reserve) by the average remaining life of the vintage. The average remaining life is a directly weighted average derived from the estimated future survivor curve in accordance with the average service life procedure.

The calculated accrued depreciation for each depreciable property group represents that portion of the depreciable cost of the group which would not be allocated to expense through future depreciation accruals if current forecasts of life characteristics are used as the basis for such accruals. The accrued depreciation calculation consists of applying an appropriate ratio to the surviving original cost of each vintage of each account based upon the attained age and service life. The straight line accrued depreciation ratios are calculated as follows for the average service life procedure:

$$Ratio = 1 - \frac{Average\ Remaining\ Life}{Average\ Service\ Life}.$$

CALCULATION OF ANNUAL AND ACCRUED AMORTIZATION

Amortization is the gradual extinguishment of an amount in an account by distributing such amount over a fixed period, over the life of the asset or liability to which it applies, or over the period during which it is anticipated the benefit will be realized. Normally, the distribution of the amount is in equal amounts to each year of the amortization period.

The calculation of annual and accrued amortization requires the selection of an amortization period. The amortization periods used in this report were based on judgment which incorporated a consideration of the period during which the assets will render most of their service, the amortization period and service lives used by other utilities, and the service life estimates previously used for the asset under depreciation accounting.

Amortization accounting is proposed for a number of accounts that represent numerous units of property, but a very small portion of depreciable electric plant in service. The accounts and their amortization periods are as follows:

ACCT	TITLE	AMORTIZATION PERIOD, YEARS
316,	Miscellaneous Power Plant Equipment	
	Office Furniture	20
	Office Equipment	15
	Computers	5
325,	Miscellaneous Power Plant Equipment	
	Office Furniture	20
	Office Equipment	15
	Computers	5
335,	Miscellaneous Power Plant Equipment	
	Office Furniture	20
	Office Equipment	15
	Computers	5
346,	Miscellaneous Power Plant Equipment	

	Office Furniture	20
	Office Equipment	15
	Computers	5
390,	Structures and Improvements – Training Assets	5
391,	Office Furniture and Equipment	
	Furniture	20
	Personal Computers	5
	Equipment	15
392,	Transportation Equipment – Training Assets	5
393,	Stores Equipment	20
394,	Tools, Shop and Garage Equipment	20
394,	Tools, Shop and Garage Equipment – Training Assets	5
395,	Laboratory Equipment	20
397,	Communication Equipment	15
397,	Communication Equipment – Training Assets	5
398,	Miscellaneous Equipment	20

For the purpose of calculating annual amortization amounts as of December 31, 2018, the book depreciation reserve for each plant account or subaccount is assigned or allocated to vintages. The book reserve assigned to vintages with an age greater than the amortization period is equal to the vintage's original cost. The remaining book reserve is allocated among vintages with an age less than the amortization period in proportion to the calculated accrued amortization. The calculated accrued amortization is equal to the original cost multiplied by the ratio of the vintage's age to its amortization period. The annual amortization amount is determined by dividing the future amortizations (original cost less allocated book reserve) by the remaining period of amortization for the vintage.

PART VI. RESULTS OF STUDY

PART VI. RESULTS OF STUDY

QUALIFICATION OF RESULTS

The calculated annual and accrued depreciation are the principal results of the study. Continued surveillance and periodic revisions are normally required to maintain continued use of appropriate annual depreciation accrual rates. An assumption that accrual rates can remain unchanged over a long period of time implies a disregard for the inherent variability in service lives and salvage and for the change of the composition of property in service. The annual accrual rates were calculated in accordance with the straight line remaining life method of depreciation, using the average service life procedure based on estimates which reflect considerations of current historical evidence and expected future conditions.

The annual depreciation accrual rates are applicable specifically to the electric plant in service as of December 31, 2018. For most plant accounts, the application of such rates to future balances that reflect additions subsequent to December 31, 2018, is reasonable for a period of three to five years.

DESCRIPTION OF DETAILED TABULATIONS

Table 1 is a summary of the results of the study as applied to the original cost of electric plant at December 31, 2018 presented on pages VI-4 through VI-7 of this report.

The service life estimates were based on judgment that incorporated statistical analysis of retirement data, discussions with management and consideration of estimates made for other electric utilities. The results of the statistical analysis of service life are presented in the section beginning on page VII-2, within the supporting documents of this report.

For each depreciable group analyzed by the retirement rate method, a chart depicting the original and estimated survivor curves followed by a tabular presentation of the original life table(s) plotted on the chart. The survivor curves estimated for the depreciable groups are shown as dark smooth curves on the charts. Each smooth survivor curve is denoted by a numeral followed by the curve type designation. The numeral used is the average life derived from the entire curve from 100 percent to zero percent surviving. The titles of the chart indicate the group, the symbol used to plot the points of the original life table, and the experience and placement bands of the life tables which where plotted. The experience band indicates the range of years for which retirements were used to develop the stub survivor curve. The placements indicate, for the related experience band, the range of years of installations which appear in the experience.

The analyses of salvage data are presented in the section titled, "Net Salvage Statistics". The tabulations present annual cost of removal and salvage data, three-year moving averages and the most recent five-year average. Data are shown in dollars and as percentages of original costs retired.

The tables of the calculated annual depreciation applicable to depreciable assets as of December 31, 2018 are presented in account sequence starting on page IX-2 of the supporting documents. The tables indicate the estimated survivor curve and net salvage percent for the account and set forth, for each installation year, the original cost, the calculated accrued depreciation, the allocated book reserve, future accruals, the remaining life, and the calculated annual accrual amount.

AMEREN MISSOURI

ELECTRIC DIVISION

TABLE 1. SUMMARY OF ESTIMATED SURVIVOR CURVES, NET SALVAGE PERCENT, ORIGINAL COST, BOOK DEPRECIATION RESERVE AND CALCULATED ANNUAL DEPRECIATION ACCRUALS RELATED TO ELECTRIC PLANT AS OF DECEMBER 31, 2018

	DEPRECIABLE GROUP	PROBABLE RETIREMENT YEAR	SURVIVOR CURVE		NET SALVAGE PERCENT	ORIGINAL COST AS OF DECEMBER 31, 2018	BOOK DEPRECIATION RESERVE	FUTURE ACCRUALS	CALCULATED ANNUAL ACCRUAL AMOUNT	CALCULATED ANNUAL ACCRUAL RATE	COMPOSITE REMAINING LIFE
	(1)	(2)	(3)		(4)	(5)	(6)	(7)	(8)	(9)=(8)/(5)	(10)=(7)/(8)
DEPRECIABLE PLANT											
	STEAM PRODUCTION PLANT										
	MERAMEC STEAM PRODUCTION PLANT										
311	STRUCTURES AND IMPROVEMENTS	09-2022	90-R1.5	*	0	49,694,023.86	38,429,334	11,264,690	3,025,081	6.09	3.7
312	BOILER PLANT EQUIPMENT	09-2022	55-R0.5	*	(1)	449,450,037.25	314,483,961	139,460,577	37,890,857	8.43	3.7
314	TURBOGENERATOR UNITS	09-2022	60-S0.5	*	0	112,835,475.34	85,939,703	26,895,772	7,265,007	6.44	3.7
315	ACCESSORY ELECTRIC EQUIPMENT	09-2022	75-S0	*	0	57,843,695.38	39,417,889	18,425,806	4,957,509	8.57	3.7
316	MISCELLANEOUS POWER PLANT EQUIPMENT	09-2022	40-L0	*	0	10,042,921.80	3,902,321	6,140,601	1,691,746	16.85	3.6
316.21	MISCELLANEOUS POWER PLANT EQUIPMENT - OFFICE FURNITURE		20-SQ		0	478,958.17	221,470	257,488	26,948	5.63	9.6
316.22	MISCELLANEOUS POWER PLANT EQUIPMENT - OFFICE EQUIPMENT		15-SQ		0	349,113.71	177,238	171,878	28,828	8.26	6.0
316.23	MISCELLANEOUS POWER PLANT EQUIPMENT - COMPUTERS		5-SQ		0	260,927.80	21,661	239,267	104,959	40.23	2.3
	TOTAL MERAMEC STEAM PRODUCTION PLANT					*680,955,153.31*	*482,593,575*	*202,856,079*	*54,990,935*		
	SIOUX STEAM PRODUCTION PLANT										
311	STRUCTURES AND IMPROVEMENTS	09-2033	90-R1.5	*	(1)	57,644,417.18	27,148,740	31,072,121	2,156,663	3.74	14.4
312	BOILER PLANT EQUIPMENT	09-2033	55-R0.5	*	(3)	959,178,604.38	383,351,769	604,602,194	43,831,427	4.57	13.8
314	TURBOGENERATOR UNITS	09-2033	60-S0.5	*	(1)	164,593,128.21	65,986,975	100,252,084	7,114,715	4.32	14.1
315	ACCESSORY ELECTRIC EQUIPMENT	09-2033	75-S0	*	(1)	127,824,998.28	40,291,485	88,811,763	6,234,898	4.88	14.2
316	MISCELLANEOUS POWER PLANT EQUIPMENT	09-2033	40-L0	*	0	13,764,462.14	2,482,303	11,282,159	872,273	6.34	12.9
316.21	MISCELLANEOUS POWER PLANT EQUIPMENT - OFFICE FURNITURE		20-SQ		0	1,153,501.58	244,615	908,887	60,812	5.27	14.9
316.22	MISCELLANEOUS POWER PLANT EQUIPMENT - OFFICE EQUIPMENT		15-SQ		0	404,151.76	342,559	61,593	5,547	1.37	11.1
316.23	MISCELLANEOUS POWER PLANT EQUIPMENT - COMPUTERS		5-SQ		0	505,483.80	288,466	217,018	89,718	17.75	2.4
	TOTAL SIOUX STEAM PRODUCTION PLANT					*1,325,068,747.33*	*520,136,912*	*837,207,819*	*60,366,053*		
	LABADIE STEAM PRODUCTION PLANT										
311	STRUCTURES AND IMPROVEMENTS	09-2042	90-R1.5	*	(2)	129,958,084.20	42,259,673	90,297,573	3,944,458	3.04	22.9
312	BOILER PLANT EQUIPMENT	09-2042	55-R0.5	*	(6)	1,019,643,582.02	354,096,680	726,725,517	34,566,137	3.39	21.0
312.03	BOILER PLANT EQUIPMENT - ALUMINUM COAL CARS		30-R2.5		25	78,356,568.00	54,520,806	4,246,620	308,927	0.39	13.7
314	TURBOGENERATOR UNITS	09-2042	60-S0.5	*	(2)	253,612,209.75	107,784,102	150,900,352	7,049,342	2.78	21.4
315	ACCESSORY ELECTRIC EQUIPMENT	09-2042	75-S0	*	(2)	117,531,789.25	49,590,782	70,291,643	3,176,608	2.70	22.1
316	MISCELLANEOUS POWER PLANT EQUIPMENT	09-2042	40-L0	*	0	18,131,397.40	4,782,986	13,348,411	729,663	4.02	18.3
316.21	MISCELLANEOUS POWER PLANT EQUIPMENT - OFFICE FURNITURE		20-SQ		0	685,482.01	239,393	446,089	37,480	5.47	11.9
316.22	MISCELLANEOUS POWER PLANT EQUIPMENT - OFFICE EQUIPMENT		15-SQ		0	474,347.83	217,409	256,939	32,061	6.76	8.0
316.23	MISCELLANEOUS POWER PLANT EQUIPMENT - COMPUTERS		5-SQ		0	1,554,304.15	319,348	1,234,956	399,738	25.72	3.1
	TOTAL LABADIE STEAM PRODUCTION PLANT					*1,619,947,764.61*	*613,811,179*	*1,057,748,100*	*50,244,414*		
	RUSH ISLAND STEAM PRODUCTION PLANT										
311	STRUCTURES AND IMPROVEMENTS	09-2045	90-R1.5	*	(2)	97,508,417.20	36,605,064	62,853,522	2,458,101	2.52	25.6
312	BOILER PLANT EQUIPMENT	09-2045	55-R0.5	*	(7)	544,885,856.65	203,384,684	379,643,183	16,372,497	3.00	23.2
314	TURBOGENERATOR UNITS	09-2045	60-S0.5	*	(3)	168,172,020.66	65,813,092	107,404,089	4,544,203	2.70	23.6
315	ACCESSORY ELECTRIC EQUIPMENT	09-2045	75-S0	*	(2)	56,059,486.15	23,877,111	33,303,565	1,354,192	2.42	24.6
316	MISCELLANEOUS POWER PLANT EQUIPMENT	09-2045	40-L0	*	0	14,402,183.03	2,235,645	12,166,538	596,783	4.14	20.4
316.21	MISCELLANEOUS POWER PLANT EQUIPMENT - OFFICE FURNITURE		20-SQ		0	548,414.59	258,921	289,494	30,877	5.63	9.4
316.22	MISCELLANEOUS POWER PLANT EQUIPMENT - OFFICE EQUIPMENT		15-SQ		0	471,772.27	272,333	199,439	18,059	3.83	11.0
316.23	MISCELLANEOUS POWER PLANT EQUIPMENT - COMPUTERS		5-SQ		0	1,305,161.97	202,279	1,102,883	277,564	21.27	4.0
	TOTAL RUSH ISLAND STEAM PRODUCTION PLANT					*883,353,312.52*	*332,649,129*	*596,962,713*	*25,652,276*		
	COMMON - ALL STEAM PLANTS										
311	STRUCTURES AND IMPROVEMENTS	09-2042	90-R1.5	*	(2)	1,976,444.53	805,929	1,210,044	53,071	2.69	22.8
312	BOILER PLANT EQUIPMENT	09-2042	55-R0.5	*	(6)	36,395,109.40	17,936,242	20,642,574	982,935	2.70	21.0
315	ACCESSORY ELECTRIC EQUIPMENT	09-2042	75-S0	*	(2)	3,129,974.57	1,318,122	1,874,452	85,277	2.72	22.0
316	MISCELLANEOUS POWER PLANT EQUIPMENT	09-2042	40-L0	*	0	17,331.45	6,124	11,207	614	3.54	18.3
	TOTAL COMMON - ALL STEAM PLANTS					*41,518,859.95*	*20,066,417*	*23,738,277*	*1,121,897*		
	TOTAL STEAM PRODUCTION PLANT					**4,550,843,837.72**	**1,969,257,212**	**2,718,512,988**	**192,375,575**	**4.23**	

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TABLE 1. SUMMARY OF ESTIMATED SURVIVOR CURVES, NET SALVAGE PERCENT, ORIGINAL COST, BOOK DEPRECIATION RESERVE AND CALCULATED ANNUAL DEPRECIATION ACCRUALS RELATED TO ELECTRIC PLANT AS OF DECEMBER 31, 2018

	DEPRECIABLE GROUP	PROBABLE RETIREMENT YEAR	SURVIVOR CURVE		NET SALVAGE PERCENT	ORIGINAL COST AS OF DECEMBER 31, 2018	BOOK DEPRECIATION RESERVE	FUTURE ACCRUALS	CALCULATED ANNUAL ACCRUAL AMOUNT	CALCULATED ANNUAL ACCRUAL RATE	COMPOSITE REMAINING LIFE
	(1)	(2)	(3)		(4)	(5)	(6)	(7)	(8)	(9)=(8)/(5)	(10)=(7)/(8)
	NUCLEAR PRODUCTION PLANT										
	CALLAWAY NUCLEAR PRODUCTION PLANT										
321	STRUCTURES AND IMPROVEMENTS	10-2044	90-R2	*	(1)	966,505,826.74	610,816,910	365,353,975	14,857,503	1.54	24.6
322	REACTOR PLANT EQUIPMENT	10-2044	50-S0.5	*	(6)	1,308,617,665.49	554,452,543	832,682,182	38,569,913	2.95	21.6
323	TURBOGENERATOR UNITS	10-2044	50-S1	*	(4)	547,183,008.35	264,842,023	304,228,306	14,543,630	2.66	20.9
324	ACCESSORY ELECTRIC EQUIPMENT	10-2044	75-R2	*	(1)	276,478,609.90	141,537,331	137,706,065	5,668,304	2.05	24.3
325	MISCELLANEOUS POWER PLANT EQUIPMENT	10-2044	35-L0.5	*	0	145,202,535.15	24,634,349	120,568,186	6,832,243	4.71	17.6
325.21	MISCELLANEOUS POWER PLANT EQUIPMENT - OFFICE FURNITURE		20-SQ		0	7,784,413.99	3,059,115	4,725,299	417,291	5.36	11.3
325.22	MISCELLANEOUS POWER PLANT EQUIPMENT - OFFICE EQUIPMENT		15-SQ		0	4,374,774.29	2,018,762	2,356,012	331,844	7.59	7.1
325.23	MISCELLANEOUS POWER PLANT EQUIPMENT - COMPUTERS		5-SQ		0	6,755,517.39	2,091,492	4,664,025	1,550,051	22.94	3.0
	TOTAL NUCLEAR PRODUCTION PLANT					**3,262,902,351.30**	**1,603,452,525**	**1,772,284,050**	**82,770,779**	**2.54**	
	HYDRAULIC PRODUCTION PLANT										
	OSAGE HYDRAULIC PRODUCTION PLANT										
331	STRUCTURES AND IMPROVEMENTS	06-2047	125-R1	*	(2)	8,949,980.69	1,232,595	7,896,385	289,823	3.24	27.2
332	RESERVOIRS, DAMS AND WATERWAYS	06-2047	150-R2.5	*	(1)	86,430,152.49	19,086,541	68,207,913	2,419,627	2.80	28.2
333	WATER WHEELS, TURBINES, AND GENERATORS	06-2047	95-S0	*	(8)	63,276,660.61	20,634,254	47,704,539	1,769,377	2.80	27.0
334	ACCESSORY ELECTRIC EQUIPMENT	06-2047	65-R1	*	(1)	30,561,495.78	6,011,729	24,855,382	953,791	3.12	26.1
335	MISCELLANEOUS POWER PLANT EQUIPMENT	06-2047	50-R0.5	*	0	2,910,935.56	(234,831)	3,145,767	131,069	4.50	24.0
335.21	MISCELLANEOUS POWER PLANT EQUIPMENT - OFFICE FURNITURE		20-SQ		0	82,651.20	25,881	56,770	4,326	5.23	13.1
335.22	MISCELLANEOUS POWER PLANT EQUIPMENT - OFFICE EQUIPMENT		15-SQ		0	97,613.22	37,488	60,124	7,204	7.38	8.3
335.23	MISCELLANEOUS POWER PLANT EQUIPMENT - COMPUTERS		5-SQ		0	865,748.48	107,984	757,764	186,205	21.51	4.1
336	ROADS, RAILROADS AND BRIDGES	06-2047	50-R0.5	*	0	77,445.03	124,170	(46,725)	0	-	-
	TOTAL OSAGE HYDRAULIC PRODUCTION PLANT					*193,252,683.06*	*47,025,812*	*152,637,919*	*5,761,422*		
	TAUM SAUK HYDRAULIC PRODUCTION PLANT										
331	STRUCTURES AND IMPROVEMENTS	06-2089	125-R1	*	(5)	22,210,082.40	4,330,384	18,990,203	301,909	1.36	62.9
332	RESERVOIRS, DAMS AND WATERWAYS	06-2089	150-R2.5	*	(3)	10,271,816.97	(6,633,668)	17,213,639	265,739	2.59	64.8
333	WATER WHEELS, TURBINES, AND GENERATORS	06-2089	95-S0	*	(26)	73,722,395.50	10,808,605	82,081,613	1,437,485	1.95	57.1
334	ACCESSORY ELECTRIC EQUIPMENT	06-2089	65-R1	*	(3)	13,146,538.53	1,741,961	11,798,974	239,861	1.82	49.2
335	MISCELLANEOUS POWER PLANT EQUIPMENT	06-2089	50-R0.5	*	0	4,763,368.66	2,937	4,760,432	115,682	2.43	41.2
335.21	MISCELLANEOUS POWER PLANT EQUIPMENT - OFFICE FURNITURE		20-SQ		0	139,273.14	33,658	105,615	7,118	5.11	14.8
335.22	MISCELLANEOUS POWER PLANT EQUIPMENT - OFFICE EQUIPMENT		15-SQ		0	605,689.45	295,871	309,818	44,095	7.28	7.0
335.23	MISCELLANEOUS POWER PLANT EQUIPMENT - COMPUTERS		5-SQ		0	330,425.22	262,981	67,444	39,565	11.97	1.7
336	ROADS, RAILROADS AND BRIDGES	06-2089	50-R0.5	*	0	232,751.79	94,385	138,367	3,234	1.39	42.8
	TOTAL TAUM SAUK HYDRAULIC PRODUCTION PLANT					*125,422,341.66*	*10,937,114*	*135,466,105*	*2,454,688*		
	KEOKUK HYDRAULIC PRODUCTION PLANT										
331	STRUCTURES AND IMPROVEMENTS	06-2055	125-R1	*	(3)	8,808,412.49	2,142,858	6,930,007	201,246	2.28	34.4
332	RESERVOIRS, DAMS AND WATERWAYS	06-2055	150-R2.5	*	(1)	18,410,282.21	7,831,984	10,762,401	302,534	1.64	35.6
333	WATER WHEELS, TURBINES, AND GENERATORS	06-2055	95-S0	*	(10)	132,187,416.47	29,075,101	116,331,057	3,431,032	2.60	33.9
334	ACCESSORY ELECTRIC EQUIPMENT	06-2055	65-R1	*	(1)	19,861,915.64	3,501,249	16,559,286	520,484	2.62	31.8
335	MISCELLANEOUS POWER PLANT EQUIPMENT	06-2055	50-R0.5	*	0	4,327,859.54	591,681	3,736,179	131,382	3.04	28.4
335.21	MISCELLANEOUS POWER PLANT EQUIPMENT - OFFICE FURNITURE		20-SQ		0	77,136.03	45,964	31,172	4,200	5.44	7.4
335.22	MISCELLANEOUS POWER PLANT EQUIPMENT - OFFICE EQUIPMENT		15-SQ		0	121,176.34	53,915	67,261	8,879	7.33	7.6
335.23	MISCELLANEOUS POWER PLANT EQUIPMENT - COMPUTERS		5-SQ		0	86,656.95	31,558	55,099	32,748	37.79	1.7
336	ROADS, RAILROADS AND BRIDGES	06-2055	50-R0.5	*	0	114,926.06	80,580	34,346	1,301	1.13	26.4
	TOTAL KEOKUK HYDRAULIC PRODUCTION PLANT					*183,995,781.75*	*43,354,690*	*154,506,808*	*4,633,806*		
	TOTAL HYDRAULIC PRODUCTION PLANT					**502,670,806.47**	**101,317,616**	**442,610,832**	**12,849,916**	**2.56**	

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TABLE 1. SUMMARY OF ESTIMATED SURVIVOR CURVES, NET SALVAGE PERCENT, ORIGINAL COST, BOOK DEPRECIATION RESERVE AND CALCULATED ANNUAL DEPRECIATION ACCRUALS RELATED TO ELECTRIC PLANT AS OF DECEMBER 31, 2018

	DEPRECIABLE GROUP	PROBABLE RETIREMENT YEAR	SURVIVOR CURVE	NET SALVAGE PERCENT	ORIGINAL COST AS OF DECEMBER 31, 2018	BOOK DEPRECIATION RESERVE	FUTURE ACCRUALS	CALCULATED ANNUAL ACCRUAL AMOUNT	CALCULATED ANNUAL ACCRUAL RATE	COMPOSITE REMAINING LIFE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)=(8)/(5)	(10)=(7)/(8)
	OTHER PRODUCTION PLANT									
341	STRUCTURES AND IMPROVEMENTS		40-R3	(5)	49,364,452.72	19,039,271	32,793,404	1,188,780	2.41	27.6
342	FUEL HOLDERS, PRODUCERS AND ACCESSORIES		45-R3	(5)	48,668,825.00	18,170,505	32,931,761	1,000,112	2.05	32.9
344	GENERATORS									
	OTHER CTS		45-R4	(5)	1,000,351,749.75	561,600,934	488,768,403	16,598,907	1.66	29.4
	MARYLAND HEIGHTS LANDFILL CTG		8-S2.5	40	8,417,407.92	4,185,509	864,936	156,408	1.86	5.5
	SOLAR		20-S2.5	0	10,680,919.38	3,897,117	6,783,802	447,666	4.19	15.2
345	ACCESSORY ELECTRIC EQUIPMENT		40-R2.5	(5)	130,267,813.77	61,618,283	75,162,921	2,765,868	2.12	27.2
346	MISCELLANEOUS POWER PLANT EQUIPMENT		22-L2.5	0	7,864,056.30	4,113,135	3,750,921	259,528	3.30	14.5
346.21	MISCELLANEOUS POWER PLANT EQUIPMENT - OFFICE FURNITURE		20-SQ	0	278,700.02	190,405	88,295	17,257	6.19	5.1
346.22	MISCELLANEOUS POWER PLANT EQUIPMENT - OFFICE EQUIPMENT		15-SQ	0	464,779.04	246,794	217,985	36,999	7.96	5.9
346.23	MISCELLANEOUS POWER PLANT EQUIPMENT - COMPUTERS		5-SQ	0	198,558.24	45,183	153,375	64,770	32.62	2.4
	TOTAL OTHER PRODUCTION PLANT				**1,256,557,262.14**	**673,107,136**	**641,515,803**	**22,536,295**	**1.79**	
	TOTAL PRODUCTION PLANT				**9,572,974,257.63**	**4,347,134,489**	**5,574,923,673**	**310,532,565**	**3.24**	
	TRANSMISSION PLANT									
352	STRUCTURES AND IMPROVEMENTS		65-R2.5	(5)	7,411,128.71	2,495,879	5,285,806	144,523	1.95	36.6
353	STATION EQUIPMENT		60-R2	(5)	378,631,139.40	91,119,170	306,443,526	6,427,929	1.70	47.7
354	TOWERS AND FIXTURES		70-R4	(40)	115,940,128.56	54,080,523	108,235,657	2,686,103	2.32	40.3
355	POLES AND FIXTURES		60-R3	(100)	427,934,972.93	123,163,034	732,706,912	14,514,668	3.39	50.5
356	OVERHEAD CONDUCTORS AND DEVICES		60-R4	(25)	287,214,596.30	97,852,582	261,165,663	6,047,577	2.11	43.2
359	ROADS AND TRAILS		70-R4	0	71,788.00	92,589	(20,801)	0	-	-
	TOTAL TRANSMISSION PLANT				**1,217,203,753.90**	**368,803,777**	**1,413,816,763**	**29,820,800**	**2.45**	
	DISTRIBUTION PLANT									
361	STRUCTURES AND IMPROVEMENTS		60-R2.5	(5)	17,567,343.40	6,312,603	12,133,108	325,010	1.85	37.3
362	STATION EQUIPMENT		60-R2.5	(10)	1,042,308,897.40	278,235,135	868,304,652	19,393,128	1.86	44.8
364	POLES AND FIXTURES		50-R2.5	(150)	1,150,500,360.14	988,081,739	1,888,169,161	52,217,766	4.54	36.2
365	OVERHEAD CONDUCTORS AND DEVICES		50-R1	(50)	1,298,755,660.19	475,419,309	1,472,714,181	38,608,948	2.97	38.1
366	UNDERGROUND CONDUIT		70-R3	(50)	494,642,755.45	113,440,654	628,523,479	11,295,332	2.28	55.6
367	UNDERGROUND CONDUCTORS AND DEVICES		57-R2	(40)	817,744,441.50	254,881,219	889,960,999	20,873,243	2.55	42.6
368	LINE TRANSFORMERS		42-R2.5	5	496,029,447.35	179,692,194	291,535,781	10,954,044	2.21	26.6
369.1	OVERHEAD SERVICES		47-R2.5	(200)	201,105,141.45	271,088,038	332,227,386	10,315,691	5.13	32.2
369.2	UNDERGROUND SERVICES		60-R3	(90)	171,673,045.18	130,302,444	195,876,342	4,767,527	2.78	41.1
370	METERS		28-S0.5	(5)	105,362,929.46	49,437,386	61,193,690	3,756,998	3.57	16.3
371	INSTALLATIONS ON CUSTOMERS' PREMISES		30-O1	0	164,613.18	169,282	(4,669)	0	-	-
373	STREET LIGHTING AND SIGNAL SYSTEMS		38-S0	(35)	160,637,119.43	81,030,207	135,829,904	4,746,128	2.95	28.6
	TOTAL DISTRIBUTION PLANT				**5,956,491,754.13**	**2,828,090,210**	**6,776,464,014**	**177,253,815**	**2.98**	
	GENERAL PLANT									
390	STRUCTURES AND IMPROVEMENTS									
	MISCELLANEOUS STRUCTURES - OLD		45-S0	(10)	4,317,432.45	3,646,872	1,102,304	123,309	2.86	8.9
	LARGE STRUCTURES		50-R1.5	(10)	270,751,463.66	74,924,062	222,902,548	6,059,145	2.24	36.8
	TOTAL STRUCTURES AND IMPROVEMENTS				*275,068,896.11*	*78,570,934*	*224,004,852*	*6,182,454*	*2.25*	

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TABLE 1. SUMMARY OF ESTIMATED SURVIVOR CURVES, NET SALVAGE PERCENT, ORIGINAL COST, BOOK DEPRECIATION RESERVE AND CALCULATED ANNUAL DEPRECIATION ACCRUALS RELATED TO ELECTRIC PLANT AS OF DECEMBER 31, 2018

	DEPRECIABLE GROUP	PROBABLE RETIREMENT YEAR	SURVIVOR CURVE	NET SALVAGE PERCENT	ORIGINAL COST AS OF DECEMBER 31, 2018	BOOK DEPRECIATION RESERVE	FUTURE ACCRUALS	CALCULATED ANNUAL ACCRUAL AMOUNT	CALCULATED ANNUAL ACCRUAL RATE	COMPOSITE REMAINING LIFE
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)=(8)/(5)	(10)=(7)/(8)
390.05	STRUCTURES AND IMPROVEMENTS - TRAINING ASSETS		5-SQ	0	934,005.31	934,005	0	0	-	-
391	OFFICE FURNITURE AND EQUIPMENT - FURNITURE		20-SQ	0	37,970,790.76	14,370,204	23,600,587	1,796,114	4.73	13.1
391.2	OFFICE FURNITURE AND EQUIPMENT - PERSONAL COMPUTERS		5-SQ	0	47,268,538.05	21,294,184	25,974,354	9,500,063	20.10	2.7
391.3	OFFICE FURNITURE AND EQUIPMENT - EQUIPMENT		15-SQ	0	3,515,735.09	1,878,517	1,637,218	212,341	6.04	7.7
392	TRANSPORTATION EQUIPMENT		11-R2	15	138,203,554.45	54,048,653	63,424,368	9,748,391	7.05	6.5
392.05	TRANSPORTATION EQUIPMENT - TRAINING ASSETS		5-SQ	0	159,840.86	159,841	0	0	-	-
393	STORES EQUIPMENT		20-SQ	0	4,122,717.39	1,627,863	2,494,854	206,087	5.00	12.1
394	TOOLS, SHOP, AND GARAGE EQUIPMENT		20-SQ	0	26,340,091.21	9,503,491	16,836,600	1,364,815	5.18	12.3
394.05	TOOLS, SHOP, AND GARAGE EQUIPMENT - TRAINING ASSETS		5-SQ	0	2,122,836.68	2,037,940	84,897	83,079	3.91	1.0
395	LABORATORY EQUIPMENT		20-SQ	0	6,850,005.49	2,987,724	3,862,281	344,995	5.04	11.2
396	POWER OPERATED EQUIPMENT		15-L2	15	14,756,068.15	3,851,143	8,691,515	925,558	6.27	9.4
397	COMMUNICATION EQUIPMENT		15-SQ	0	88,074,234.18	35,533,857	52,540,377	5,759,261	6.54	9.1
397.05	COMMUNICATION EQUIPMENT - TRAINING ASSETS		5-SQ	0	12,326.14	12,326	0	0	-	-
398	MISCELLANEOUS EQUIPMENT		20-SQ	0	1,564,890.98	513,460	1,051,431	77,891	4.98	13.5
	TOTAL GENERAL PLANT				646,964,530.85	227,324,142	424,203,334	36,201,049	5.60	
	TOTAL DEPRECIABLE ELECTRIC PLANT				17,393,634,296.51	7,771,352,618	14,189,407,784	553,808,229	3.18	
	ACCOUNTS NOT STUDIED									
302	FRANCHISES AND CONSENTS				78,131,749.09					
303	MISCELLANEOUS INTANGIBLE PLANT				219,933,568.12					
310	LAND AND LAND RIGHTS				15,538,963.18	1				
317	ARO - STEAM PRODUCTION				103,216,295.26	53,714,956				
320	LAND AND LAND RIGHTS				9,793,884.68					
326	ARO - NUCLEAR PRODUCTION				63,516,164.17	(19,805,359)				
330	LAND AND LAND RIGHTS				18,105,284.63					
340	LAND AND LAND RIGHTS				6,912,475.61					
350	LAND AND LAND RIGHTS				59,853,896.94					
360	LAND AND LAND RIGHTS				35,604,104.95	(1,083)				
373.1	ARO - DISTRIBUTION PLANT				(2,913,604.30)					
389	LAND AND LAND RIGHTS				13,626,253.29	(1,398)				
399.1	ARO - GENERAL PLANT				2,551,590.35	575,755				
	TOTAL ACCOUNTS NOT STUDIED				623,870,625.97	34,482,872				
	TOTAL ELECTRIC PLANT				18,017,504,922.48	7,805,835,489		553,808,229	3.07	

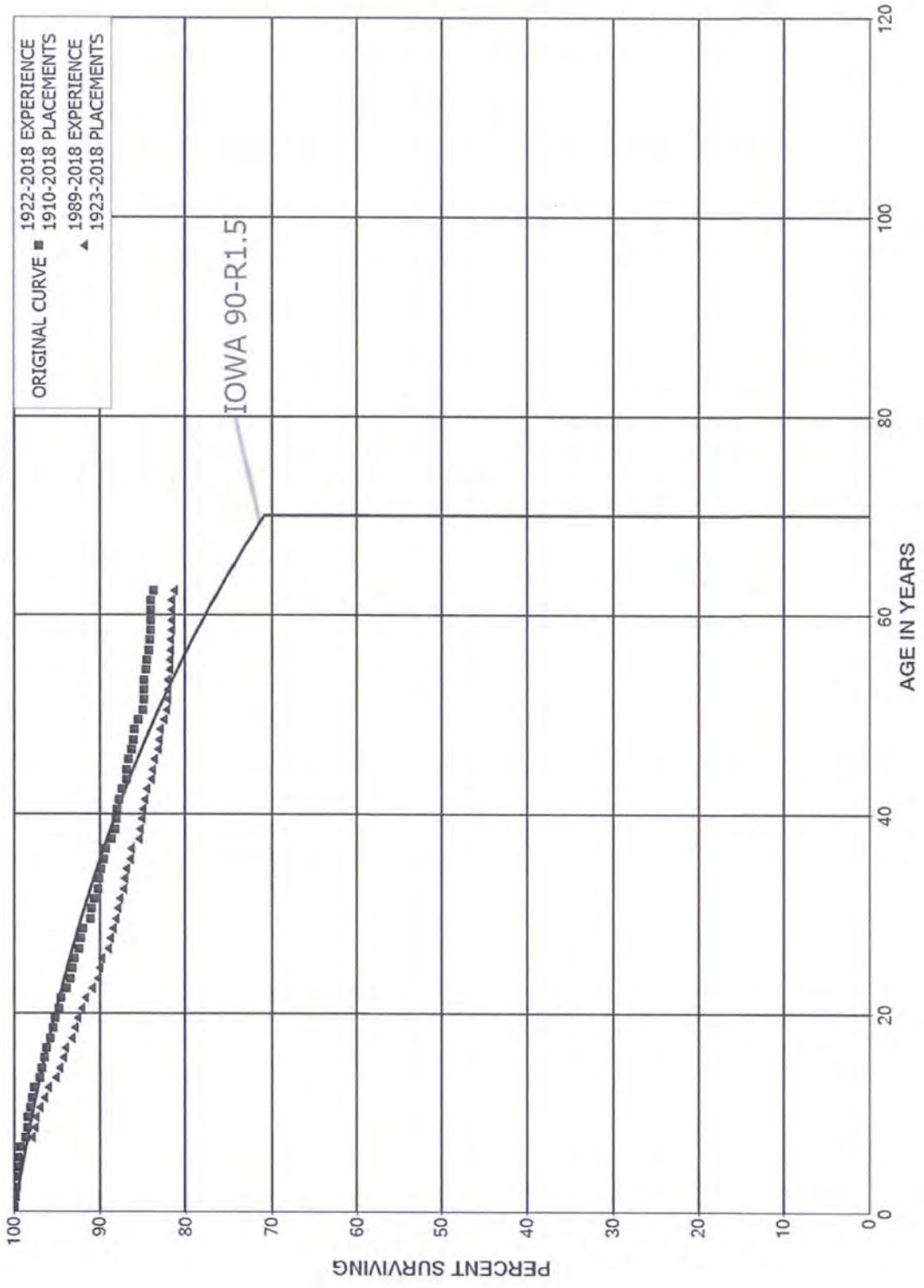
* CURVE SHOWN IS INTERIM SURVIVOR CURVE.

NOTE: NEW ADDITIONS FOR UTILITY SCALE WIND GENERATION, SOLAR GENERATION AND ENERGY STORAGE EQUIPMENT WILL HAVE THE FOLLOWING LIFE AND NET SALVAGE PARAMETERS AND DEPRECIATION RATES. WHEN PLACED IN SERVICE, WIND ASSETS WILL ALSO HAVE A 30-YEAR LIFE SPAN:

ACCOUNT	DESCRIPTION	INTERIM SURVIVOR CURVE	NET SALVAGE PERCENT	ACCRUAL RATE
341	STRUCTURES AND IMPROVEMENTS - WIND	70-R2.5	(5)	3.53
344	GENERATORS - WIND	45-R2	(5)	3.71
345	ACCESSORY ELECTRIC EQUIPMENT - WIND	40-R2.5	(5)	3.70
346	MISCELLANEOUS POWER PLANT EQUIPMENT - WIND	35-S2.5	(5)	3.70
341	STRUCTURES AND IMPROVEMENTS - SOLAR	20-R4	0	5.00
345	ACCESSORY ELECTRIC EQUIPMENT - SOLAR	20-S2.5	0	5.00
348	ENERGY STORAGE EQUIPMENT	10-L3	0	10.00
351	ENERGY STORAGE EQUIPMENT	10-L3	0	10.00
363	STORAGE BATTERY EQUIPMENT	10-L3	0	10.00

PART VII. SERVICE LIFE STATISTICS

AMEREN MISSOURI
ACCOUNT 311 STRUCTURES AND IMPROVEMENTS
ORIGINAL AND SMOOTH SURVIVOR CURVES



AMEREN MISSOURI

ACCOUNT 311 STRUCTURES AND IMPROVEMENTS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1910-2018 EXPERIENCE BAND 1922-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	392,615,626	38,151	0.0001	0.9999	100.00
0.5	312,756,739	329,583	0.0011	0.9989	99.99
1.5	313,859,289	509,126	0.0016	0.9984	99.88
2.5	295,030,461	174,039	0.0006	0.9994	99.72
3.5	294,295,077	412,266	0.0014	0.9986	99.66
4.5	289,748,978	153,895	0.0005	0.9995	99.52
5.5	287,750,225	649,464	0.0023	0.9977	99.47
6.5	280,790,507	1,754,296	0.0062	0.9938	99.25
7.5	273,057,487	559,601	0.0020	0.9980	98.63
8.5	263,429,540	195,296	0.0007	0.9993	98.42
9.5	247,644,740	705,594	0.0028	0.9972	98.35
10.5	241,449,166	697,474	0.0029	0.9971	98.07
11.5	233,281,241	531,704	0.0023	0.9977	97.79
12.5	228,994,944	1,371,641	0.0060	0.9940	97.57
13.5	221,662,975	660,861	0.0030	0.9970	96.98
14.5	216,697,503	669,278	0.0031	0.9969	96.69
15.5	210,520,815	408,898	0.0019	0.9981	96.39
16.5	202,647,872	1,039,256	0.0051	0.9949	96.21
17.5	190,956,035	586,146	0.0031	0.9969	95.71
18.5	189,046,820	464,697	0.0025	0.9975	95.42
19.5	187,674,882	821,044	0.0044	0.9956	95.18
20.5	186,172,909	597,564	0.0032	0.9968	94.77
21.5	183,580,327	1,251,428	0.0068	0.9932	94.46
22.5	176,317,043	895,103	0.0051	0.9949	93.82
23.5	173,585,995	302,248	0.0017	0.9983	93.34
24.5	169,223,348	335,694	0.0020	0.9980	93.18
25.5	159,403,710	1,045,160	0.0066	0.9934	93.00
26.5	155,157,047	325,503	0.0021	0.9979	92.39
27.5	151,168,488	455,174	0.0030	0.9970	92.19
28.5	144,313,719	1,403,578	0.0097	0.9903	91.92
29.5	140,821,779	188,704	0.0013	0.9987	91.02
30.5	139,067,766	490,328	0.0035	0.9965	90.90
31.5	137,742,729	543,635	0.0039	0.9961	90.58
32.5	135,770,700	287,415	0.0021	0.9979	90.22
33.5	133,982,840	309,963	0.0023	0.9977	90.03
34.5	132,335,615	505,150	0.0038	0.9962	89.82
35.5	130,132,678	235,255	0.0018	0.9982	89.48
36.5	129,159,906	1,093,804	0.0085	0.9915	89.32
37.5	126,933,505	494,318	0.0039	0.9961	88.56
38.5	123,803,230	227,644	0.0018	0.9982	88.22

AMEREN MISSOURI

ACCOUNT 311 STRUCTURES AND IMPROVEMENTS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1910-2018 EXPERIENCE BAND 1922-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	123,283,129	200,588	0.0016	0.9984	88.05
40.5	122,376,097	248,371	0.0020	0.9980	87.91
41.5	113,410,725	464,959	0.0041	0.9959	87.73
42.5	84,038,335	472,101	0.0056	0.9944	87.37
43.5	83,642,483	83,409	0.0010	0.9990	86.88
44.5	83,493,379	186,066	0.0022	0.9978	86.79
45.5	78,249,188	321,347	0.0041	0.9959	86.60
46.5	71,280,429	144,525	0.0020	0.9980	86.25
47.5	66,049,539	89,290	0.0014	0.9986	86.07
48.5	55,972,199	299,337	0.0053	0.9947	85.95
49.5	55,191,345	349,447	0.0063	0.9937	85.49
50.5	50,777,558	52,390	0.0010	0.9990	84.95
51.5	43,958,505	12,598	0.0003	0.9997	84.87
52.5	41,344,597	10,902	0.0003	0.9997	84.84
53.5	35,978,610	67,089	0.0019	0.9981	84.82
54.5	29,487,210	72,861	0.0025	0.9975	84.66
55.5	27,846,219	56,991	0.0020	0.9980	84.45
56.5	26,550,274	40,233	0.0015	0.9985	84.28
57.5	21,787,462	17,467	0.0008	0.9992	84.15
58.5	21,679,181		0.0000	1.0000	84.08
59.5	15,786,473		0.0000	1.0000	84.08
60.5	12,871,995		0.0000	1.0000	84.08
61.5	9,690,594	41,277	0.0043	0.9957	84.08
62.5	9,032,602		0.0000	1.0000	83.73
63.5	670,055		0.0000	1.0000	83.73
64.5	667,381		0.0000	1.0000	83.73
65.5	627,315		0.0000	1.0000	83.73
66.5	610,173		0.0000	1.0000	83.73
67.5	610,173		0.0000	1.0000	83.73
68.5	610,173		0.0000	1.0000	83.73
69.5	610,173		0.0000	1.0000	83.73
70.5	610,173		0.0000	1.0000	83.73
71.5	610,173		0.0000	1.0000	83.73
72.5	610,173		0.0000	1.0000	83.73
73.5	610,173	610,173	1.0000		83.73
74.5					
75.5					
76.5					
77.5					
78.5	276		0.0000		
79.5					

AMEREN MISSOURI

ACCOUNT 311 STRUCTURES AND IMPROVEMENTS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1923-2018 EXPERIENCE BAND 1989-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	233,688,658	0	0.0000	1.0000	100.00
0.5	155,590,059	307,388	0.0020	0.9980	100.00
1.5	158,040,483	374,595	0.0024	0.9976	99.80
2.5	140,602,665	80,473	0.0006	0.9994	99.57
3.5	141,177,092	60,502	0.0004	0.9996	99.51
4.5	138,034,836	42,886	0.0003	0.9997	99.47
5.5	137,504,839	537,445	0.0039	0.9961	99.44
6.5	131,927,037	1,704,227	0.0129	0.9871	99.05
7.5	125,524,326	444,165	0.0035	0.9965	97.77
8.5	118,927,986	103,754	0.0009	0.9991	97.42
9.5	103,551,928	578,955	0.0056	0.9944	97.34
10.5	97,865,961	467,838	0.0048	0.9952	96.79
11.5	99,049,734	492,567	0.0050	0.9950	96.33
12.5	133,915,189	1,278,712	0.0095	0.9905	95.85
13.5	126,752,971	564,589	0.0045	0.9955	94.94
14.5	122,100,305	579,815	0.0047	0.9953	94.51
15.5	122,073,511	237,617	0.0019	0.9981	94.06
16.5	121,942,641	990,313	0.0081	0.9919	93.88
17.5	116,248,852	455,332	0.0039	0.9961	93.12
18.5	126,244,702	450,507	0.0036	0.9964	92.75
19.5	124,962,110	631,438	0.0051	0.9949	92.42
20.5	127,907,432	571,240	0.0045	0.9955	91.96
21.5	131,735,955	1,207,082	0.0092	0.9908	91.54
22.5	124,540,963	851,341	0.0068	0.9932	90.71
23.5	121,958,818	294,388	0.0024	0.9976	90.09
24.5	117,714,308	303,973	0.0026	0.9974	89.87
25.5	107,987,163	976,964	0.0090	0.9910	89.64
26.5	103,871,368	279,650	0.0027	0.9973	88.83
27.5	105,028,478	381,169	0.0036	0.9964	88.59
28.5	98,561,083	415,247	0.0042	0.9958	88.26
29.5	101,400,188	171,593	0.0017	0.9983	87.89
30.5	99,695,772	322,777	0.0032	0.9968	87.74
31.5	98,600,373	444,355	0.0045	0.9955	87.46
32.5	96,746,701	172,924	0.0018	0.9982	87.07
33.5	103,690,553	275,929	0.0027	0.9973	86.91
34.5	102,144,043	464,774	0.0046	0.9954	86.68
35.5	100,272,884	117,115	0.0012	0.9988	86.28
36.5	99,485,653	1,003,089	0.0101	0.9899	86.18
37.5	97,593,814	153,808	0.0016	0.9984	85.31
38.5	95,951,534	226,237	0.0024	0.9976	85.18

AMEREN MISSOURI

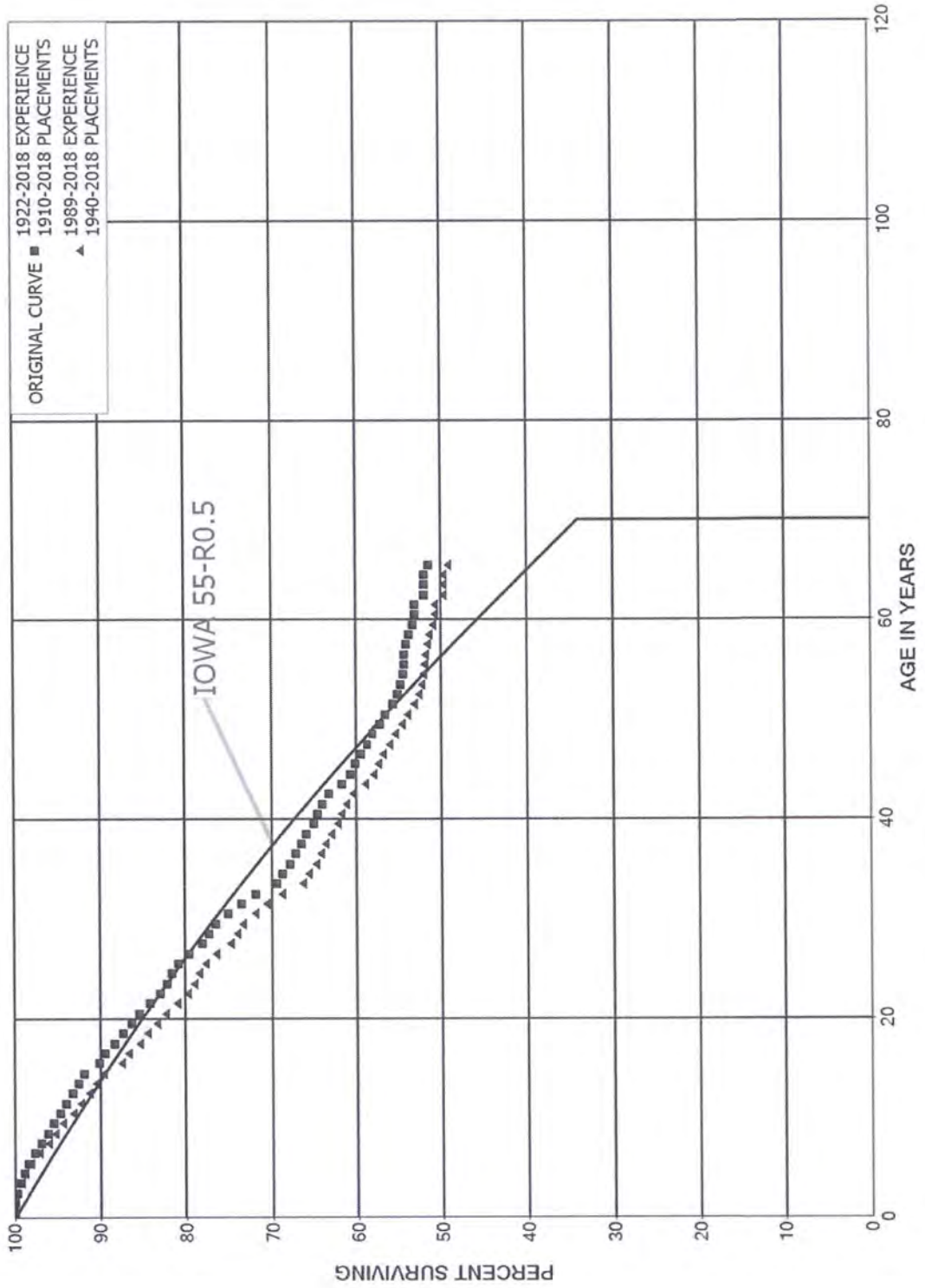
ACCOUNT 311 STRUCTURES AND IMPROVEMENTS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1923-2018 EXPERIENCE BAND 1989-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	99,559,137	192,943	0.0019	0.9981	84.98
40.5	102,034,911	244,670	0.0024	0.9976	84.81
41.5	95,126,705	290,918	0.0031	0.9969	84.61
42.5	67,110,643	443,348	0.0066	0.9934	84.35
43.5	66,916,700	63,054	0.0009	0.9991	83.80
44.5	66,910,847	136,647	0.0020	0.9980	83.72
45.5	62,510,520	321,199	0.0051	0.9949	83.55
46.5	58,308,448	85,084	0.0015	0.9985	83.12
47.5	56,660,627	88,655	0.0016	0.9984	82.99
48.5	47,729,910	272,252	0.0057	0.9943	82.86
49.5	47,364,756	190,304	0.0040	0.9960	82.39
50.5	43,110,861	52,276	0.0012	0.9988	82.06
51.5	37,092,478	11,906	0.0003	0.9997	81.96
52.5	35,396,604	9,626	0.0003	0.9997	81.94
53.5	31,584,352	62,096	0.0020	0.9980	81.91
54.5	28,760,030	18,869	0.0007	0.9993	81.75
55.5	27,173,031	21,289	0.0008	0.9992	81.70
56.5	25,912,788	12,920	0.0005	0.9995	81.63
57.5	21,177,289	17,467	0.0008	0.9992	81.59
58.5	21,069,008		0.0000	1.0000	81.53
59.5	15,176,300		0.0000	1.0000	81.53
60.5	12,261,822		0.0000	1.0000	81.53
61.5	9,080,421	41,277	0.0045	0.9955	81.53
62.5	8,422,429		0.0000	1.0000	81.16
63.5	81,066		0.0000	1.0000	81.16
64.5	78,392		0.0000	1.0000	81.16
65.5	38,326		0.0000	1.0000	81.16
66.5	21,184		0.0000	1.0000	81.16
67.5	21,184		0.0000	1.0000	81.16
68.5	21,184		0.0000	1.0000	81.16
69.5	21,184		0.0000	1.0000	81.16
70.5	21,184		0.0000	1.0000	81.16
71.5	21,184		0.0000	1.0000	81.16
72.5	21,184		0.0000	1.0000	81.16
73.5	21,184	21,184	1.0000		81.16
74.5					
75.5					
76.5					
77.5					
78.5	276		0.0000		
79.5					

AMEREN MISSOURI
ACCOUNT 312 BOILER PLANT EQUIPMENT
ORIGINAL AND SMOOTH SURVIVOR CURVES



AMEREN MISSOURI

ACCOUNT 312 BOILER PLANT EQUIPMENT

ORIGINAL LIFE TABLE

PLACEMENT BAND 1910-2018 EXPERIENCE BAND 1922-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	3,706,915,564	64,419	0.0000	1.0000	100.00
0.5	3,511,882,813	1,976,241	0.0006	0.9994	100.00
1.5	3,463,688,299	7,445,013	0.0021	0.9979	99.94
2.5	3,219,917,335	15,754,373	0.0049	0.9951	99.73
3.5	3,161,594,284	11,894,812	0.0038	0.9962	99.24
4.5	2,883,127,465	13,936,687	0.0048	0.9952	98.87
5.5	2,831,418,238	22,925,471	0.0081	0.9919	98.39
6.5	2,714,712,571	21,538,203	0.0079	0.9921	97.59
7.5	2,680,637,727	19,449,260	0.0073	0.9927	96.82
8.5	2,115,956,808	14,818,562	0.0070	0.9930	96.11
9.5	2,077,963,579	18,467,717	0.0089	0.9911	95.44
10.5	2,004,105,161	14,659,815	0.0073	0.9927	94.59
11.5	1,911,926,145	14,382,413	0.0075	0.9925	93.90
12.5	1,839,615,905	13,701,543	0.0074	0.9926	93.19
13.5	1,779,967,327	13,572,247	0.0076	0.9924	92.50
14.5	1,668,056,658	30,897,737	0.0185	0.9815	91.80
15.5	1,565,486,736	12,056,093	0.0077	0.9923	90.10
16.5	1,417,405,432	18,461,454	0.0130	0.9870	89.40
17.5	1,272,964,125	13,287,779	0.0104	0.9896	88.24
18.5	1,233,113,327	14,058,537	0.0114	0.9886	87.32
19.5	1,183,683,165	12,890,695	0.0109	0.9891	86.32
20.5	1,165,556,866	16,991,097	0.0146	0.9854	85.38
21.5	1,112,519,078	16,346,154	0.0147	0.9853	84.14
22.5	981,788,574	8,154,723	0.0083	0.9917	82.90
23.5	923,140,196	6,720,891	0.0073	0.9927	82.21
24.5	872,784,228	8,698,958	0.0100	0.9900	81.61
25.5	833,277,170	11,867,565	0.0142	0.9858	80.80
26.5	806,674,079	16,270,909	0.0202	0.9798	79.65
27.5	784,677,747	7,667,795	0.0098	0.9902	78.04
28.5	765,473,953	7,636,789	0.0100	0.9900	77.28
29.5	755,469,159	13,821,462	0.0183	0.9817	76.51
30.5	741,023,024	15,324,668	0.0207	0.9793	75.11
31.5	723,243,126	17,240,296	0.0238	0.9762	73.56
32.5	692,087,465	23,601,060	0.0341	0.9659	71.80
33.5	666,664,374	6,299,251	0.0094	0.9906	69.35
34.5	658,127,689	8,540,975	0.0130	0.9870	68.70
35.5	597,180,992	5,998,668	0.0100	0.9900	67.81
36.5	571,947,102	4,950,511	0.0087	0.9913	67.13
37.5	522,358,939	5,017,191	0.0096	0.9904	66.54
38.5	513,606,353	6,140,163	0.0120	0.9880	65.91

AMEREN MISSOURI

ACCOUNT 312 BOILER PLANT EQUIPMENT

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1910-2018 EXPERIENCE BAND 1922-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	504,633,190	3,486,983	0.0069	0.9931	65.12
40.5	500,408,193	4,816,742	0.0096	0.9904	64.67
41.5	429,798,231	5,054,996	0.0118	0.9882	64.04
42.5	327,447,483	7,991,135	0.0244	0.9756	63.29
43.5	318,121,317	5,332,536	0.0168	0.9832	61.75
44.5	312,164,157	3,019,949	0.0097	0.9903	60.71
45.5	253,267,269	2,643,307	0.0104	0.9896	60.12
46.5	193,737,866	2,573,000	0.0133	0.9867	59.50
47.5	151,456,116	1,778,428	0.0117	0.9883	58.71
48.5	104,380,913	1,484,553	0.0142	0.9858	58.02
49.5	102,346,302	1,304,522	0.0127	0.9873	57.19
50.5	84,356,215	1,230,034	0.0146	0.9854	56.46
51.5	62,167,764	611,020	0.0098	0.9902	55.64
52.5	57,944,232	377,916	0.0065	0.9935	55.09
53.5	53,289,511	305,247	0.0057	0.9943	54.73
54.5	51,143,855	91,703	0.0018	0.9982	54.42
55.5	50,885,605	47,410	0.0009	0.9991	54.32
56.5	49,766,536	238,484	0.0048	0.9952	54.27
57.5	32,327,001	142,244	0.0044	0.9956	54.01
58.5	31,480,191	297,497	0.0095	0.9905	53.77
59.5	14,005,124	52,606	0.0038	0.9962	53.27
60.5	12,478,599	13,162	0.0011	0.9989	53.07
61.5	12,594,181	246,737	0.0196	0.9804	53.01
62.5	11,801,679	4,946	0.0004	0.9996	51.97
63.5	11,158,877		0.0000	1.0000	51.95
64.5	5,738,157	59,113	0.0103	0.9897	51.95
65.5					51.41

AMEREN MISSOURI

ACCOUNT 312 BOILER PLANT EQUIPMENT

ORIGINAL LIFE TABLE

PLACEMENT BAND 1940-2018 EXPERIENCE BAND 1989-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	2,807,524,593	392	0.0000	1.0000	100.00
0.5	2,615,556,082	1,836,508	0.0007	0.9993	100.00
1.5	2,572,187,766	5,560,374	0.0022	0.9978	99.93
2.5	2,347,229,063	15,502,591	0.0066	0.9934	99.71
3.5	2,294,835,726	10,630,989	0.0046	0.9954	99.06
4.5	2,022,466,411	12,992,268	0.0064	0.9936	98.60
5.5	2,034,898,104	21,524,339	0.0106	0.9894	97.96
6.5	1,961,598,664	21,076,039	0.0107	0.9893	96.93
7.5	1,982,581,821	17,863,394	0.0090	0.9910	95.89
8.5	1,428,611,426	13,379,972	0.0094	0.9906	95.02
9.5	1,397,670,015	17,216,422	0.0123	0.9877	94.13
10.5	1,328,693,627	13,403,983	0.0101	0.9899	92.97
11.5	1,334,778,136	13,457,168	0.0101	0.9899	92.03
12.5	1,382,782,455	13,049,527	0.0094	0.9906	91.11
13.5	1,325,166,403	13,267,080	0.0100	0.9900	90.25
14.5	1,214,489,593	28,387,812	0.0234	0.9766	89.34
15.5	1,191,968,647	10,583,921	0.0089	0.9911	87.25
16.5	1,120,040,188	17,174,450	0.0153	0.9847	86.48
17.5	1,033,657,505	11,158,365	0.0108	0.9892	85.15
18.5	1,060,645,929	13,628,024	0.0128	0.9872	84.23
19.5	1,014,675,103	11,830,586	0.0117	0.9883	83.15
20.5	1,028,220,645	16,462,628	0.0160	0.9840	82.18
21.5	1,010,907,487	15,914,446	0.0157	0.9843	80.87
22.5	880,784,335	8,043,013	0.0091	0.9909	79.59
23.5	822,729,032	6,154,754	0.0075	0.9925	78.87
24.5	774,200,223	8,079,303	0.0104	0.9896	78.28
25.5	735,635,685	11,528,395	0.0157	0.9843	77.46
26.5	710,562,832	15,689,948	0.0221	0.9779	76.25
27.5	718,898,132	6,896,129	0.0096	0.9904	74.56
28.5	700,628,876	6,655,331	0.0095	0.9905	73.85
29.5	708,647,492	13,691,945	0.0193	0.9807	73.15
30.5	694,759,331	13,470,278	0.0194	0.9806	71.73
31.5	679,065,570	16,854,530	0.0248	0.9752	70.34
32.5	648,419,043	23,238,739	0.0358	0.9642	68.60
33.5	624,160,368	5,663,322	0.0091	0.9909	66.14
34.5	624,204,691	8,279,387	0.0133	0.9867	65.54
35.5	573,672,438	5,605,471	0.0098	0.9902	64.67
36.5	548,934,582	4,691,423	0.0085	0.9915	64.04
37.5	500,567,972	5,017,191	0.0100	0.9900	63.49
38.5	495,162,549	6,136,797	0.0124	0.9876	62.85

AMEREN MISSOURI

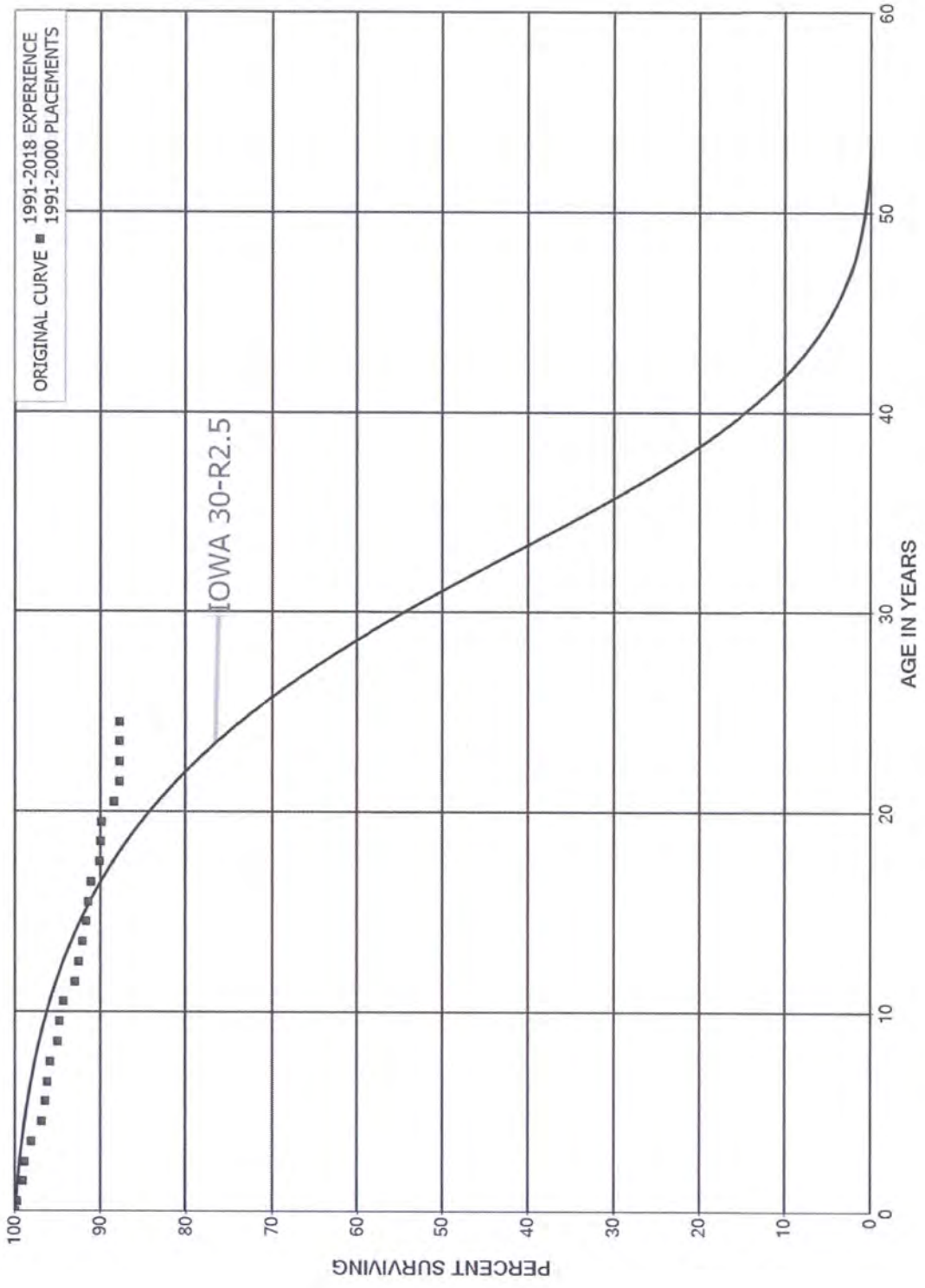
ACCOUNT 312 BOILER PLANT EQUIPMENT

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1940-2018 EXPERIENCE BAND 1989-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	491,232,310	3,466,006	0.0071	0.9929	62.07
40.5	488,052,749	4,806,405	0.0098	0.9902	61.64
41.5	419,231,228	4,989,009	0.0119	0.9881	61.03
42.5	317,612,068	7,990,387	0.0252	0.9748	60.30
43.5	308,305,466	5,299,760	0.0172	0.9828	58.79
44.5	302,661,476	2,929,167	0.0097	0.9903	57.77
45.5	244,827,780	2,640,288	0.0108	0.9892	57.22
46.5	187,626,490	2,560,399	0.0136	0.9864	56.60
47.5	147,655,074	1,769,978	0.0120	0.9880	55.83
48.5	101,781,891	1,440,228	0.0142	0.9858	55.16
49.5	99,791,605	1,106,200	0.0111	0.9889	54.38
50.5	82,290,517	1,215,334	0.0148	0.9852	53.77
51.5	60,555,906	611,020	0.0101	0.9899	52.98
52.5	57,193,744	377,916	0.0066	0.9934	52.45
53.5	53,187,117	305,247	0.0057	0.9943	52.10
54.5	51,041,461	91,703	0.0018	0.9982	51.80
55.5	50,783,211	47,410	0.0009	0.9991	51.71
56.5	49,664,142	238,484	0.0048	0.9952	51.66
57.5	32,310,808	142,244	0.0044	0.9956	51.41
58.5	31,463,998	297,497	0.0095	0.9905	51.18
59.5	13,988,931	52,606	0.0038	0.9962	50.70
60.5	12,462,406	11,262	0.0009	0.9991	50.51
61.5	12,579,888	246,737	0.0196	0.9804	50.46
62.5	11,787,386	4,946	0.0004	0.9996	49.47
63.5	11,158,877		0.0000	1.0000	49.45
64.5	5,738,157	59,113	0.0103	0.9897	49.45
65.5					48.94

AMEREN MISSOURI
ACCOUNT 312.03 BOILER PLANT EQUIPMENT - ALUMINUM COAL CARS
ORIGINAL AND SMOOTH SURVIVOR CURVES



AMEREN MISSOURI

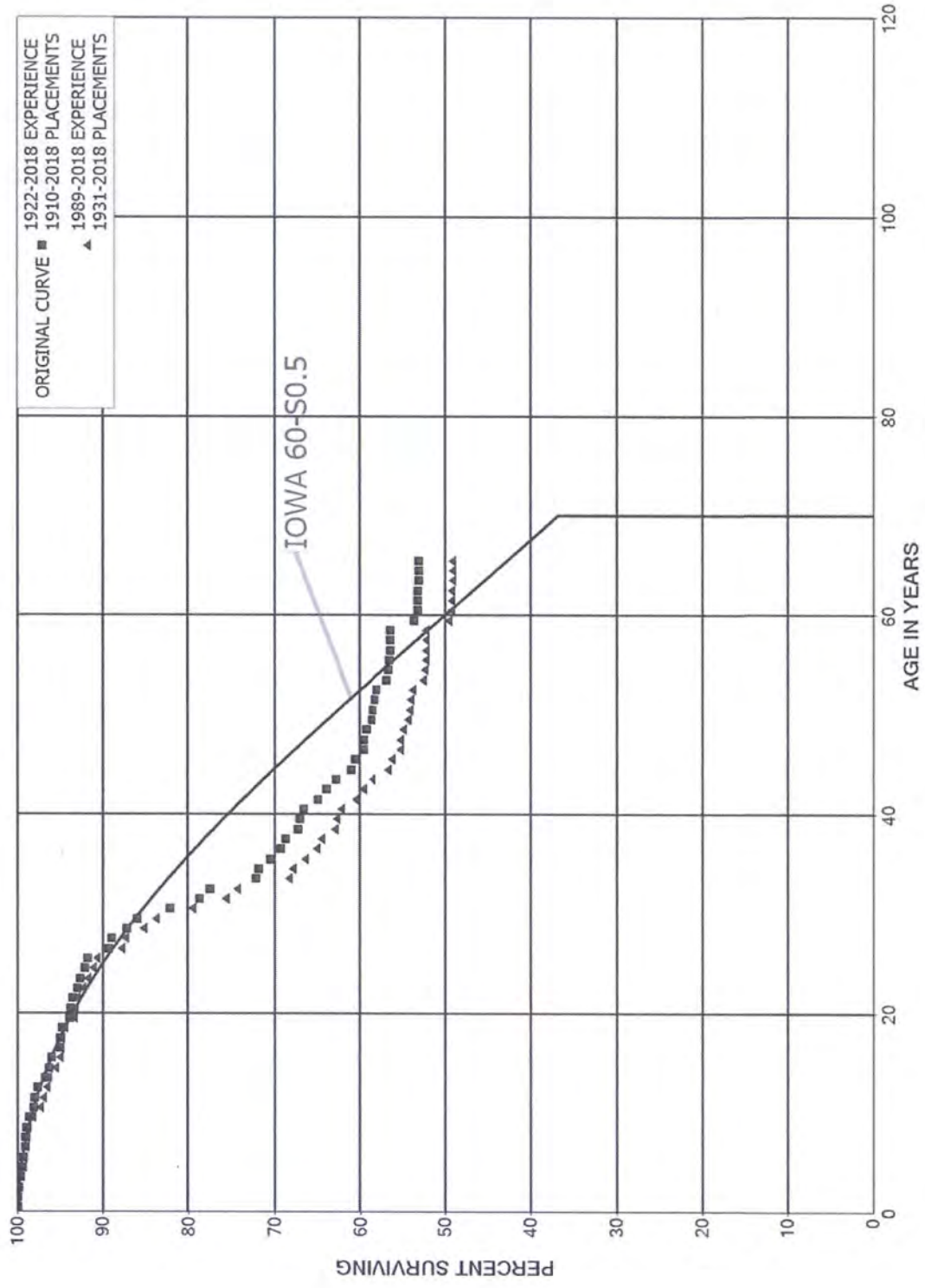
ACCOUNT 312.03 BOILER PLANT EQUIPMENT - ALUMINUM COAL CARS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1991-2000 EXPERIENCE BAND 1991-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	126,171,499	346,242	0.0027	0.9973	100.00
0.5	125,825,257	895,117	0.0071	0.9929	99.73
1.5	124,930,140	178,445	0.0014	0.9986	99.02
2.5	124,751,695	1,068,112	0.0086	0.9914	98.87
3.5	123,683,583	1,497,150	0.0121	0.9879	98.03
4.5	122,186,433	525,366	0.0043	0.9957	96.84
5.5	121,661,066	363,795	0.0030	0.9970	96.43
6.5	121,297,271	321,204	0.0026	0.9974	96.14
7.5	120,976,068	1,185,274	0.0098	0.9902	95.88
8.5	119,790,794	311,406	0.0026	0.9974	94.94
9.5	119,355,157	482,077	0.0040	0.9960	94.70
10.5	118,873,079	1,758,509	0.0148	0.9852	94.31
11.5	117,114,570	512,981	0.0044	0.9956	92.92
12.5	116,540,182	629,750	0.0054	0.9946	92.51
13.5	115,845,960	472,218	0.0041	0.9959	92.01
14.5	115,314,528	314,471	0.0027	0.9973	91.64
15.5	115,000,057	451,228	0.0039	0.9961	91.39
16.5	114,435,661	1,179,176	0.0103	0.9897	91.03
17.5	113,256,486	168,309	0.0015	0.9985	90.09
18.5	56,875,816	104,494	0.0018	0.9982	89.96
19.5	50,378,462	787,835	0.0156	0.9844	89.79
20.5	49,590,627	392,721	0.0079	0.9921	88.39
21.5	34,889,289		0.0000	1.0000	87.69
22.5	27,990,805		0.0000	1.0000	87.69
23.5	15,674,127		0.0000	1.0000	87.69
24.5					87.69

AMEREN MISSOURI
ACCOUNT 314 TURBOGENERATOR UNITS
ORIGINAL AND SMOOTH SURVIVOR CURVES



AMEREN MISSOURI

ACCOUNT 314 TURBOGENERATOR UNITS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1910-2018 EXPERIENCE BAND 1922-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	857,174,518	207,333	0.0002	0.9998	100.00
0.5	851,193,713	250,605	0.0003	0.9997	99.98
1.5	859,676,919	653,811	0.0008	0.9992	99.95
2.5	818,279,005	2,248,406	0.0027	0.9973	99.87
3.5	823,697,368	1,621,681	0.0020	0.9980	99.60
4.5	817,183,762	732,499	0.0009	0.9991	99.40
5.5	791,248,741	1,536,967	0.0019	0.9981	99.31
6.5	724,506,374	402,662	0.0006	0.9994	99.12
7.5	684,500,924	561,723	0.0008	0.9992	99.06
8.5	635,540,591	2,022,291	0.0032	0.9968	98.98
9.5	629,790,771	3,588,370	0.0057	0.9943	98.67
10.5	591,887,494	1,153,577	0.0019	0.9981	98.10
11.5	584,536,488	1,644,321	0.0028	0.9972	97.91
12.5	576,999,938	5,080,823	0.0088	0.9912	97.64
13.5	520,869,543	2,659,288	0.0051	0.9949	96.78
14.5	482,092,436	1,873,985	0.0039	0.9961	96.28
15.5	432,465,672	4,291,119	0.0099	0.9901	95.91
16.5	387,267,697	167,358	0.0004	0.9996	94.96
17.5	358,579,352	842,375	0.0023	0.9977	94.92
18.5	347,537,928	3,237,955	0.0093	0.9907	94.69
19.5	313,930,801	160,908	0.0005	0.9995	93.81
20.5	311,892,420	816,972	0.0026	0.9974	93.76
21.5	306,665,577	1,709,508	0.0056	0.9944	93.52
22.5	303,250,144	1,328,833	0.0044	0.9956	93.00
23.5	296,427,349	1,641,888	0.0055	0.9945	92.59
24.5	286,613,627	1,167,883	0.0041	0.9959	92.08
25.5	284,453,062	7,511,095	0.0264	0.9736	91.70
26.5	276,025,649	938,538	0.0034	0.9966	89.28
27.5	272,973,296	5,397,307	0.0198	0.9802	88.98
28.5	266,350,739	4,003,874	0.0150	0.9850	87.22
29.5	262,056,244	11,431,403	0.0436	0.9564	85.91
30.5	250,210,625	10,454,558	0.0418	0.9582	82.16
31.5	239,194,365	3,657,235	0.0153	0.9847	78.73
32.5	235,379,273	16,100,538	0.0684	0.9316	77.52
33.5	218,873,313	1,150,323	0.0053	0.9947	72.22
34.5	209,428,418	3,807,274	0.0182	0.9818	71.84
35.5	205,604,179	3,728,046	0.0181	0.9819	70.53
36.5	201,548,639	1,468,991	0.0073	0.9927	69.25
37.5	200,064,176	4,182,515	0.0209	0.9791	68.75
38.5	195,808,132	581,311	0.0030	0.9970	67.31

AMEREN MISSOURI

ACCOUNT 314 TURBOGENERATOR UNITS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1910-2018 EXPERIENCE BAND 1922-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	191,615,865	1,521,517	0.0079	0.9921	67.11
40.5	190,024,426	4,731,092	0.0249	0.9751	66.58
41.5	169,835,231	2,430,381	0.0143	0.9857	64.92
42.5	134,238,462	2,361,755	0.0176	0.9824	63.99
43.5	131,859,023	3,874,873	0.0294	0.9706	62.87
44.5	127,407,991	817,259	0.0064	0.9936	61.02
45.5	113,400,594	1,882,111	0.0166	0.9834	60.63
46.5	93,886,877	31,405	0.0003	0.9997	59.62
47.5	84,697,007	484,745	0.0057	0.9943	59.60
48.5	69,193,446	741,070	0.0107	0.9893	59.26
49.5	68,289,425	168,347	0.0025	0.9975	58.63
50.5	59,345,223	148,840	0.0025	0.9975	58.48
51.5	51,084,367	211,126	0.0041	0.9959	58.34
52.5	46,281,168	1,024,684	0.0221	0.9779	58.09
53.5	43,057,183	179,634	0.0042	0.9958	56.81
54.5	40,746,348	50,669	0.0012	0.9988	56.57
55.5	37,630,413	61,957	0.0016	0.9984	56.50
56.5	37,043,083	888	0.0000	1.0000	56.41
57.5	26,243,515		0.0000	1.0000	56.41
58.5	16,298,092	816,741	0.0501	0.9499	56.41
59.5	12,824,410	92,266	0.0072	0.9928	53.58
60.5	12,894,500	11,853	0.0009	0.9991	53.19
61.5	11,423,517		0.0000	1.0000	53.15
62.5	11,423,517	7,703	0.0007	0.9993	53.15
63.5	11,380,654		0.0000	1.0000	53.11
64.5	7,056,116		0.0000	1.0000	53.11
65.5	295,550		0.0000	1.0000	53.11
66.5	295,550		0.0000	1.0000	53.11
67.5	295,550		0.0000	1.0000	53.11
68.5	295,550		0.0000	1.0000	53.11
69.5	295,550		0.0000	1.0000	53.11
70.5	295,550		0.0000	1.0000	53.11
71.5					53.11

AMEREN MISSOURI

ACCOUNT 314 TURBOGENERATOR UNITS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1931-2018 EXPERIENCE BAND 1989-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	555,692,059		0.0000	1.0000	100.00
0.5	550,330,199	237,363	0.0004	0.9996	100.00
1.5	559,410,484	394,515	0.0007	0.9993	99.96
2.5	520,850,688	2,175,354	0.0042	0.9958	99.89
3.5	527,196,088	1,468,959	0.0028	0.9972	99.47
4.5	533,808,018	668,813	0.0013	0.9987	99.19
5.5	509,794,532	1,278,760	0.0025	0.9975	99.07
6.5	443,897,461	297,869	0.0007	0.9993	98.82
7.5	404,437,508	561,150	0.0014	0.9986	98.75
8.5	365,668,608	2,018,386	0.0055	0.9945	98.62
9.5	362,356,019	3,285,424	0.0091	0.9909	98.07
10.5	324,800,790	1,141,950	0.0035	0.9965	97.18
11.5	347,822,536	1,610,842	0.0046	0.9954	96.84
12.5	387,743,004	1,019,530	0.0026	0.9974	96.39
13.5	335,677,258	2,616,330	0.0078	0.9922	96.14
14.5	296,943,109	1,796,822	0.0061	0.9939	95.39
15.5	270,956,309	364,159	0.0013	0.9987	94.81
16.5	257,218,762	162,193	0.0006	0.9994	94.68
17.5	244,680,458	810,057	0.0033	0.9967	94.63
18.5	256,239,127	3,225,185	0.0126	0.9874	94.31
19.5	222,707,730	67,748	0.0003	0.9997	93.12
20.5	234,096,616	792,371	0.0034	0.9966	93.10
21.5	243,503,033	1,696,454	0.0070	0.9930	92.78
22.5	240,127,492	1,308,721	0.0055	0.9945	92.13
23.5	233,340,967	1,635,117	0.0070	0.9930	91.63
24.5	223,545,740	1,167,883	0.0052	0.9948	90.99
25.5	221,386,793	7,213,441	0.0326	0.9674	90.52
26.5	213,291,280	934,821	0.0044	0.9956	87.57
27.5	225,610,324	5,396,440	0.0239	0.9761	87.18
28.5	229,142,713	3,982,707	0.0174	0.9826	85.10
29.5	225,485,369	11,419,859	0.0506	0.9494	83.62
30.5	213,653,986	10,454,558	0.0489	0.9511	79.38
31.5	202,638,374	3,656,830	0.0180	0.9820	75.50
32.5	198,840,015	16,096,129	0.0810	0.9190	74.14
33.5	182,373,056	1,150,323	0.0063	0.9937	68.13
34.5	178,084,034	3,807,274	0.0214	0.9786	67.71
35.5	182,351,204	3,728,046	0.0204	0.9796	66.26
36.5	178,313,164	1,468,991	0.0082	0.9918	64.90
37.5	176,832,684	4,182,515	0.0237	0.9763	64.37
38.5	177,187,605	581,311	0.0033	0.9967	62.85

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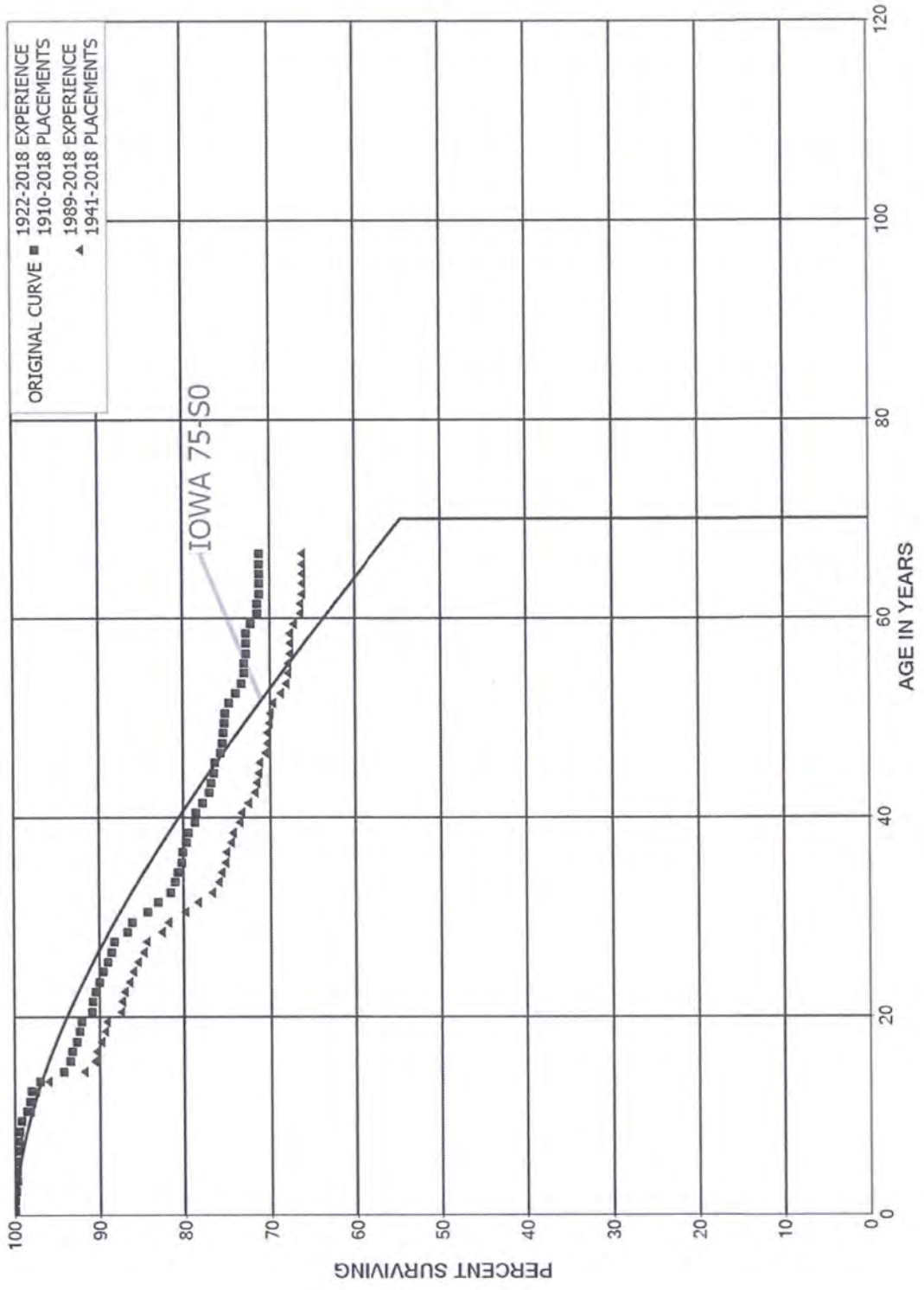
ACCOUNT 314 TURBOGENERATOR UNITS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1931-2018 EXPERIENCE BAND 1989-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	176,421,054	1,521,517	0.0086	0.9914	62.64
40.5	176,484,405	4,730,842	0.0268	0.9732	62.10
41.5	158,235,837	2,430,381	0.0154	0.9846	60.43
42.5	123,254,961	2,361,755	0.0192	0.9808	59.51
43.5	120,881,549	3,874,873	0.0321	0.9679	58.37
44.5	117,014,520	817,259	0.0070	0.9930	56.50
45.5	104,801,292	1,882,111	0.0180	0.9820	56.10
46.5	86,471,927	31,405	0.0004	0.9996	55.09
47.5	80,528,178	484,745	0.0060	0.9940	55.07
48.5	65,969,910	741,070	0.0112	0.9888	54.74
49.5	65,067,463	168,347	0.0026	0.9974	54.13
50.5	56,682,688	148,840	0.0026	0.9974	53.99
51.5	49,220,106	211,126	0.0043	0.9957	53.85
52.5	45,272,838	1,024,684	0.0226	0.9774	53.61
53.5	42,758,358	179,634	0.0042	0.9958	52.40
54.5	40,447,522	50,669	0.0013	0.9987	52.18
55.5	37,331,587	61,957	0.0017	0.9983	52.12
56.5	36,744,258	888	0.0000	1.0000	52.03
57.5	26,240,239		0.0000	1.0000	52.03
58.5	16,294,816	816,741	0.0501	0.9499	52.03
59.5	12,821,134	92,266	0.0072	0.9928	49.42
60.5	12,891,224	11,853	0.0009	0.9991	49.06
61.5	11,420,241		0.0000	1.0000	49.02
62.5	11,420,241	7,703	0.0007	0.9993	49.02
63.5	11,380,654		0.0000	1.0000	48.99
64.5	7,056,116		0.0000	1.0000	48.99
65.5	295,550		0.0000	1.0000	48.99
66.5	295,550		0.0000	1.0000	48.99
67.5	295,550		0.0000	1.0000	48.99
68.5	295,550		0.0000	1.0000	48.99
69.5	295,550		0.0000	1.0000	48.99
70.5	295,550		0.0000	1.0000	48.99
71.5					48.99

AMEREN MISSOURI
ACCOUNT 315 ACCESSORY ELECTRIC EQUIPMENT
ORIGINAL AND SMOOTH SURVIVOR CURVES



AMEREN MISSOURI

ACCOUNT 315 ACCESSORY ELECTRIC EQUIPMENT

ORIGINAL LIFE TABLE

PLACEMENT BAND 1910-2018 EXPERIENCE BAND 1922-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	333,299,499	2,012	0.0000	1.0000	100.00
0.5	319,997,602	66,432	0.0002	0.9998	100.00
1.5	319,555,735	484,120	0.0015	0.9985	99.98
2.5	341,023,004	226,861	0.0007	0.9993	99.83
3.5	345,241,420	78,229	0.0002	0.9998	99.76
4.5	329,593,391	64,565	0.0002	0.9998	99.74
5.5	325,487,174	417,339	0.0013	0.9987	99.72
6.5	300,065,772	274,719	0.0009	0.9991	99.59
7.5	297,920,047	477,064	0.0016	0.9984	99.50
8.5	220,492,072	412,768	0.0019	0.9981	99.34
9.5	217,242,021	1,447,097	0.0067	0.9933	99.15
10.5	208,901,532	596,290	0.0029	0.9971	98.49
11.5	197,690,400	595,082	0.0030	0.9970	98.21
12.5	194,472,964	1,834,285	0.0094	0.9906	97.92
13.5	184,760,788	5,294,955	0.0287	0.9713	96.99
14.5	164,386,873	1,392,515	0.0085	0.9915	94.21
15.5	157,777,960	392,532	0.0025	0.9975	93.42
16.5	145,675,813	824,584	0.0057	0.9943	93.18
17.5	135,394,346	541,656	0.0040	0.9960	92.66
18.5	133,005,375	274,677	0.0021	0.9979	92.29
19.5	128,679,516	1,759,098	0.0137	0.9863	92.09
20.5	126,408,596	174,811	0.0014	0.9986	90.84
21.5	122,247,884	414,688	0.0034	0.9966	90.71
22.5	113,243,786	550,886	0.0049	0.9951	90.40
23.5	108,349,764	563,679	0.0052	0.9948	89.96
24.5	105,232,710	575,295	0.0055	0.9945	89.49
25.5	102,593,135	614,685	0.0060	0.9940	89.01
26.5	101,551,699	366,035	0.0036	0.9964	88.47
27.5	100,442,207	1,701,416	0.0169	0.9831	88.15
28.5	98,242,168	735,257	0.0075	0.9925	86.66
29.5	95,604,591	1,885,640	0.0197	0.9803	86.01
30.5	90,911,607	1,292,278	0.0142	0.9858	84.31
31.5	90,303,096	1,574,992	0.0174	0.9826	83.12
32.5	88,134,818	705,724	0.0080	0.9920	81.67
33.5	87,647,675	335,192	0.0038	0.9962	81.01
34.5	87,282,309	400,014	0.0046	0.9954	80.70
35.5	84,619,654	117,512	0.0014	0.9986	80.33
36.5	84,935,637	491,546	0.0058	0.9942	80.22
37.5	83,334,418	258,621	0.0031	0.9969	79.76
38.5	82,689,308	768,475	0.0093	0.9907	79.51

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ACCOUNT 315 ACCESSORY ELECTRIC EQUIPMENT

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1910-2018 EXPERIENCE BAND 1922-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	81,561,713	196,243	0.0024	0.9976	78.77
40.5	81,583,331	821,546	0.0101	0.9899	78.58
41.5	75,491,960	716,941	0.0095	0.9905	77.79
42.5	63,267,788	193,379	0.0031	0.9969	77.05
43.5	62,917,102	245,044	0.0039	0.9961	76.82
44.5	62,788,239	120,235	0.0019	0.9981	76.52
45.5	56,008,074	493,046	0.0088	0.9912	76.37
46.5	46,381,444	144,715	0.0031	0.9969	75.70
47.5	41,668,786	17,949	0.0004	0.9996	75.46
48.5	31,998,089	50,859	0.0016	0.9984	75.43
49.5	31,198,974	60,717	0.0019	0.9981	75.31
50.5	27,758,367	151,062	0.0054	0.9946	75.16
51.5	22,637,761	252,947	0.0112	0.9888	74.75
52.5	21,121,304	193,316	0.0092	0.9908	73.92
53.5	19,545,929	76,456	0.0039	0.9961	73.24
54.5	18,217,251		0.0000	1.0000	72.96
55.5	16,756,493	57,173	0.0034	0.9966	72.96
56.5	16,308,609		0.0000	1.0000	72.71
57.5	12,176,549	2,407	0.0002	0.9998	72.71
58.5	11,787,564	75,744	0.0064	0.9936	72.69
59.5	7,072,296	84,750	0.0120	0.9880	72.22
60.5	6,606,621		0.0000	1.0000	71.36
61.5	5,109,848	13,629	0.0027	0.9973	71.36
62.5	5,084,925		0.0000	1.0000	71.17
63.5	5,046,153		0.0000	1.0000	71.17
64.5	3,213,192		0.0000	1.0000	71.17
65.5	3,103		0.0000	1.0000	71.17
66.5					71.17

AMEREN MISSOURI

ACCOUNT 315 ACCESSORY ELECTRIC EQUIPMENT

ORIGINAL LIFE TABLE

PLACEMENT BAND 1941-2018 EXPERIENCE BAND 1989-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	234,638,658	80	0.0000	1.0000	100.00
0.5	221,672,802	60,359	0.0003	0.9997	100.00
1.5	221,577,104	458,130	0.0021	0.9979	99.97
2.5	244,176,045	180,127	0.0007	0.9993	99.77
3.5	248,910,773	21,613	0.0001	0.9999	99.69
4.5	234,306,263	12,612	0.0001	0.9999	99.68
5.5	233,766,994	335,925	0.0014	0.9986	99.68
6.5	209,122,407	193,211	0.0009	0.9991	99.54
7.5	208,408,516	296,081	0.0014	0.9986	99.44
8.5	131,548,480	346,201	0.0026	0.9974	99.30
9.5	128,548,226	1,373,365	0.0107	0.9893	99.04
10.5	120,291,783	340,080	0.0028	0.9972	97.98
11.5	114,843,186	523,914	0.0046	0.9954	97.71
12.5	123,680,663	1,780,501	0.0144	0.9856	97.26
13.5	114,169,240	5,013,797	0.0439	0.9561	95.86
14.5	94,227,140	1,304,640	0.0138	0.9862	91.65
15.5	94,769,712	174,979	0.0018	0.9982	90.38
16.5	93,307,188	627,884	0.0067	0.9933	90.21
17.5	89,175,530	466,154	0.0052	0.9948	89.61
18.5	97,487,151	262,261	0.0027	0.9973	89.14
19.5	93,274,245	1,689,693	0.0181	0.9819	88.90
20.5	96,080,386	108,327	0.0011	0.9989	87.29
21.5	96,995,161	381,244	0.0039	0.9961	87.19
22.5	88,057,207	532,982	0.0061	0.9939	86.85
23.5	83,254,575	505,236	0.0061	0.9939	86.32
24.5	80,201,149	512,686	0.0064	0.9936	85.80
25.5	77,635,061	578,906	0.0075	0.9925	85.25
26.5	76,680,717	288,256	0.0038	0.9962	84.61
27.5	79,325,045	1,674,376	0.0211	0.9789	84.30
28.5	77,241,644	726,712	0.0094	0.9906	82.52
29.5	77,245,539	1,884,579	0.0244	0.9756	81.74
30.5	72,578,038	1,290,524	0.0178	0.9822	79.75
31.5	72,021,458	1,572,119	0.0218	0.9782	78.33
32.5	69,945,337	701,013	0.0100	0.9900	76.62
33.5	69,500,019	330,252	0.0048	0.9952	75.85
34.5	70,885,321	398,945	0.0056	0.9944	75.49
35.5	71,603,384	115,820	0.0016	0.9984	75.06
36.5	71,941,787	488,200	0.0068	0.9932	74.94
37.5	70,455,570	258,436	0.0037	0.9963	74.43
38.5	70,552,983	768,397	0.0109	0.9891	74.16

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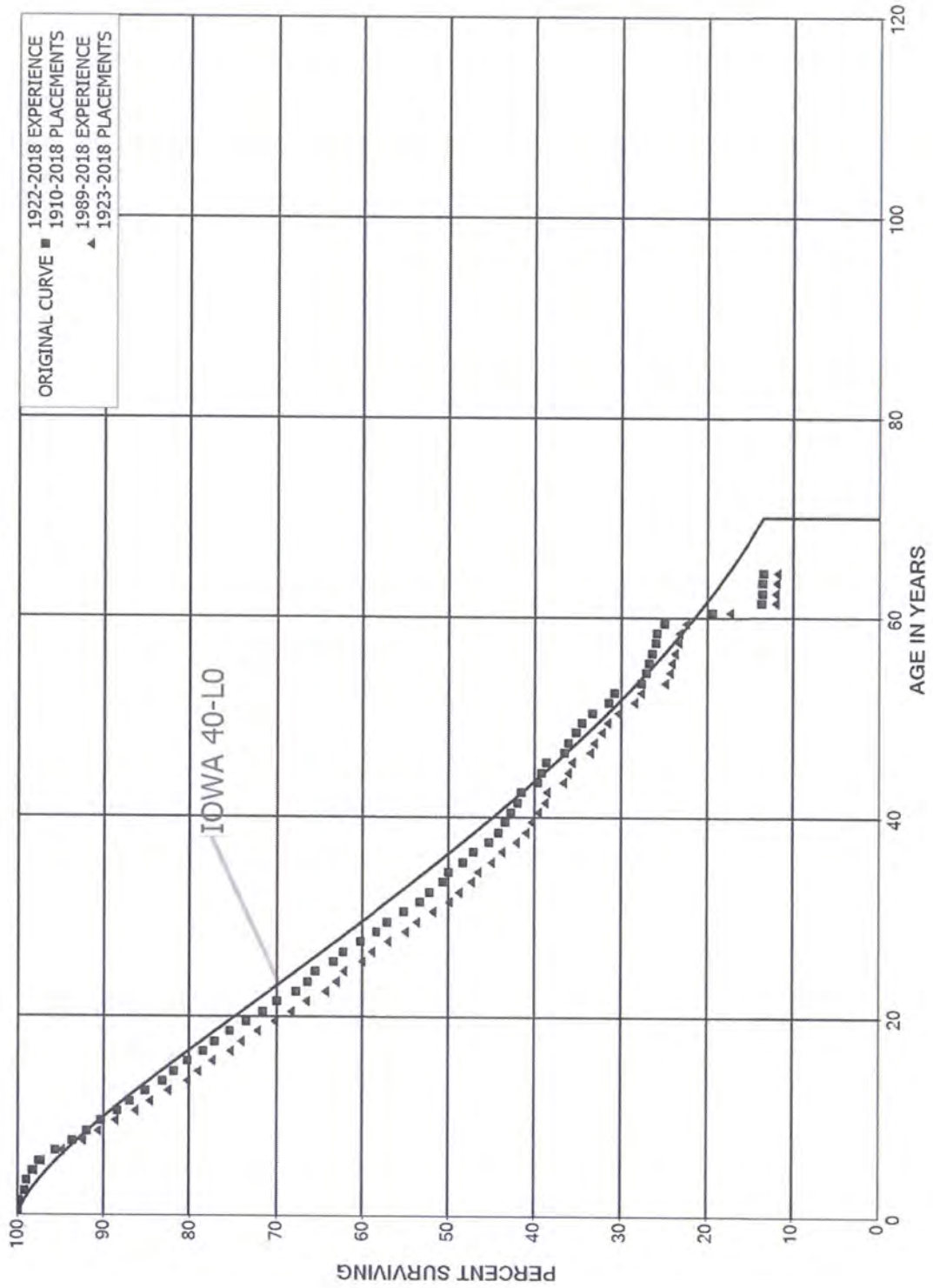
ACCOUNT 315 ACCESSORY ELECTRIC EQUIPMENT

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1941-2018 EXPERIENCE BAND 1989-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	70,371,012	187,364	0.0027	0.9973	73.35
40.5	71,918,528	798,500	0.0111	0.9889	73.16
41.5	67,291,490	699,580	0.0104	0.9896	72.35
42.5	55,513,736	162,019	0.0029	0.9971	71.59
43.5	55,212,902	162,433	0.0029	0.9971	71.39
44.5	55,278,941	80,320	0.0015	0.9985	71.18
45.5	49,830,977	470,585	0.0094	0.9906	71.07
46.5	40,943,128	144,637	0.0035	0.9965	70.40
47.5	38,948,066	17,646	0.0005	0.9995	70.15
48.5	29,410,801	49,398	0.0017	0.9983	70.12
49.5	29,278,566	51,664	0.0018	0.9982	70.00
50.5	25,898,099	138,454	0.0053	0.9947	69.88
51.5	20,901,217	252,947	0.0121	0.9879	69.51
52.5	19,939,494	193,316	0.0097	0.9903	68.66
53.5	19,065,788	76,456	0.0040	0.9960	68.00
54.5	18,211,175		0.0000	1.0000	67.73
55.5	16,751,041	57,173	0.0034	0.9966	67.73
56.5	16,303,157		0.0000	1.0000	67.49
57.5	12,171,097	2,407	0.0002	0.9998	67.49
58.5	11,782,112	75,744	0.0064	0.9936	67.48
59.5	7,066,844	84,750	0.0120	0.9880	67.05
60.5	6,601,169		0.0000	1.0000	66.24
61.5	5,104,396	13,629	0.0027	0.9973	66.24
62.5	5,079,473		0.0000	1.0000	66.07
63.5	5,046,153		0.0000	1.0000	66.07
64.5	3,213,192		0.0000	1.0000	66.07
65.5	3,103		0.0000	1.0000	66.07
66.5					66.07

AMEREN MISSOURI
ACCOUNT 316 MISCELLANEOUS POWER PLANT EQUIPMENT
ORIGINAL AND SMOOTH SURVIVOR CURVES



AMEREN MISSOURI

ACCOUNT 316 MISCELLANEOUS POWER PLANT EQUIPMENT

ORIGINAL LIFE TABLE

PLACEMENT BAND 1910-2018 EXPERIENCE BAND 1922-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	94,785,092	2,836	0.0000	1.0000	100.00
0.5	92,052,550	167,772	0.0018	0.9982	100.00
1.5	88,192,281	528,952	0.0060	0.9940	99.81
2.5	83,692,619	196,408	0.0023	0.9977	99.22
3.5	80,355,920	584,399	0.0073	0.9927	98.98
4.5	75,402,940	602,763	0.0080	0.9920	98.26
5.5	71,397,762	1,403,890	0.0197	0.9803	97.48
6.5	66,247,399	1,366,974	0.0206	0.9794	95.56
7.5	62,227,778	1,079,242	0.0173	0.9827	93.59
8.5	58,199,441	1,049,226	0.0180	0.9820	91.97
9.5	54,664,398	1,142,971	0.0209	0.9791	90.31
10.5	51,163,853	829,095	0.0162	0.9838	88.42
11.5	48,304,085	1,023,535	0.0212	0.9788	86.99
12.5	44,243,941	1,028,457	0.0232	0.9768	85.14
13.5	41,155,823	652,145	0.0158	0.9842	83.16
14.5	38,589,913	711,318	0.0184	0.9816	81.85
15.5	35,951,289	806,917	0.0224	0.9776	80.34
16.5	33,491,987	588,361	0.0176	0.9824	78.54
17.5	31,527,914	727,900	0.0231	0.9769	77.16
18.5	30,036,631	764,900	0.0255	0.9745	75.37
19.5	28,140,161	709,918	0.0252	0.9748	73.45
20.5	26,736,209	628,023	0.0235	0.9765	71.60
21.5	25,462,086	799,705	0.0314	0.9686	69.92
22.5	23,767,342	458,928	0.0193	0.9807	67.72
23.5	22,297,582	292,394	0.0131	0.9869	66.42
24.5	20,993,532	685,768	0.0327	0.9673	65.55
25.5	18,960,252	337,306	0.0178	0.9822	63.40
26.5	17,815,064	567,996	0.0319	0.9681	62.28
27.5	16,553,351	523,325	0.0316	0.9684	60.29
28.5	15,552,541	351,513	0.0226	0.9774	58.38
29.5	14,625,589	483,793	0.0331	0.9669	57.06
30.5	13,969,925	487,421	0.0349	0.9651	55.18
31.5	13,243,535	281,441	0.0213	0.9787	53.25
32.5	12,408,489	357,221	0.0288	0.9712	52.12
33.5	11,509,581	161,738	0.0141	0.9859	50.62
34.5	10,933,610	353,512	0.0323	0.9677	49.91
35.5	10,170,397	254,217	0.0250	0.9750	48.29
36.5	9,506,681	360,454	0.0379	0.9621	47.09
37.5	8,936,054	228,270	0.0255	0.9745	45.30
38.5	8,347,532	132,483	0.0159	0.9841	44.15

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ACCOUNT 316 MISCELLANEOUS POWER PLANT EQUIPMENT

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1910-2018 EXPERIENCE BAND 1922-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	7,966,127	138,816	0.0174	0.9826	43.44
40.5	7,635,969	137,157	0.0180	0.9820	42.69
41.5	6,957,633	60,618	0.0087	0.9913	41.92
42.5	5,396,890	248,282	0.0460	0.9540	41.56
43.5	5,081,948	58,835	0.0116	0.9884	39.64
44.5	4,891,481	70,698	0.0145	0.9855	39.18
45.5	4,279,309	231,410	0.0541	0.9459	38.62
46.5	3,065,196	39,457	0.0129	0.9871	36.53
47.5	2,556,355	62,943	0.0246	0.9754	36.06
48.5	1,519,501	30,943	0.0204	0.9796	35.17
49.5	1,460,648	50,860	0.0348	0.9652	34.46
50.5	1,296,405	71,945	0.0555	0.9445	33.26
51.5	873,755	19,922	0.0228	0.9772	31.41
52.5	729,126	73,533	0.1009	0.8991	30.69
53.5	633,032	12,830	0.0203	0.9797	27.60
54.5	603,115	7,465	0.0124	0.9876	27.04
55.5	580,065	5,763	0.0099	0.9901	26.70
56.5	521,947	9,380	0.0180	0.9820	26.44
57.5	480,596	3,117	0.0065	0.9935	25.96
58.5	444,574	15,176	0.0341	0.9659	25.80
59.5	354,883	78,572	0.2214	0.7786	24.92
60.5	244,326	73,205	0.2996	0.7004	19.40
61.5	108,548	459	0.0042	0.9958	13.59
62.5	106,874	468	0.0044	0.9956	13.53
63.5	105,977	997	0.0094	0.9906	13.47
64.5	83,527	520	0.0062	0.9938	13.34
65.5	43,982	257	0.0058	0.9942	13.26
66.5	16,662		0.0000	1.0000	13.18
67.5	16,512		0.0000	1.0000	13.18
68.5	16,439		0.0000	1.0000	13.18
69.5	16,439	7,384	0.4492	0.5508	13.18
70.5	9,056		0.0000	1.0000	7.26
71.5	9,003		0.0000	1.0000	7.26
72.5	8,909		0.0000	1.0000	7.26
73.5	8,909		0.0000	1.0000	7.26
74.5	8,887		0.0000	1.0000	7.26
75.5	8,254		0.0000	1.0000	7.26
76.5	405		0.0000	1.0000	7.26
77.5	405		0.0000	1.0000	7.26
78.5	405		0.0000	1.0000	7.26

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ACCOUNT 316 MISCELLANEOUS POWER PLANT EQUIPMENT

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1910-2018 EXPERIENCE BAND 1922-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
79.5	129		0.0000	1.0000	7.26
80.5	101		0.0000	1.0000	7.26
81.5	101		0.0000	1.0000	7.26
82.5	101	101	1.0000		7.26
83.5					

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ACCOUNT 316 MISCELLANEOUS POWER PLANT EQUIPMENT

ORIGINAL LIFE TABLE

PLACEMENT BAND 1923-2018 EXPERIENCE BAND 1989-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	74,533,140	1,293	0.0000	1.0000	100.00
0.5	72,292,698	159,509	0.0022	0.9978	100.00
1.5	69,232,924	503,718	0.0073	0.9927	99.78
2.5	65,140,655	170,234	0.0026	0.9974	99.05
3.5	63,093,329	524,225	0.0083	0.9917	98.79
4.5	58,964,446	545,659	0.0093	0.9907	97.97
5.5	55,801,003	1,371,044	0.0246	0.9754	97.07
6.5	52,048,742	1,303,337	0.0250	0.9750	94.68
7.5	48,793,723	976,760	0.0200	0.9800	92.31
8.5	45,765,897	1,017,133	0.0222	0.9778	90.46
9.5	42,887,823	1,100,795	0.0257	0.9743	88.45
10.5	39,930,432	751,145	0.0188	0.9812	86.18
11.5	37,889,381	965,066	0.0255	0.9745	84.56
12.5	36,221,152	966,910	0.0267	0.9733	82.41
13.5	33,431,677	541,287	0.0162	0.9838	80.21
14.5	31,161,648	659,649	0.0212	0.9788	78.91
15.5	29,342,636	779,443	0.0266	0.9734	77.24
16.5	28,068,548	456,983	0.0163	0.9837	75.19
17.5	26,849,151	669,599	0.0249	0.9751	73.96
18.5	26,826,855	751,968	0.0280	0.9720	72.12
19.5	25,018,732	697,269	0.0279	0.9721	70.10
20.5	23,979,950	613,732	0.0256	0.9744	68.14
21.5	23,337,348	779,054	0.0334	0.9666	66.40
22.5	21,727,085	425,095	0.0196	0.9804	64.18
23.5	20,453,241	286,177	0.0140	0.9860	62.93
24.5	19,256,276	656,860	0.0341	0.9659	62.05
25.5	17,333,361	323,237	0.0186	0.9814	59.93
26.5	16,336,197	562,012	0.0344	0.9656	58.81
27.5	15,156,090	506,692	0.0334	0.9666	56.79
28.5	14,322,756	348,401	0.0243	0.9757	54.89
29.5	13,481,612	478,205	0.0355	0.9645	53.55
30.5	12,864,498	479,609	0.0373	0.9627	51.65
31.5	12,190,020	268,519	0.0220	0.9780	49.73
32.5	11,387,375	353,644	0.0311	0.9689	48.63
33.5	10,511,494	157,714	0.0150	0.9850	47.12
34.5	10,005,702	349,220	0.0349	0.9651	46.42
35.5	9,426,218	239,163	0.0254	0.9746	44.80
36.5	8,954,396	353,049	0.0394	0.9606	43.66
37.5	8,427,477	225,509	0.0268	0.9732	41.94
38.5	7,901,865	131,804	0.0167	0.9833	40.82

AMEREN MISSOURI

ACCOUNT 316 MISCELLANEOUS POWER PLANT EQUIPMENT

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1923-2018 EXPERIENCE BAND 1989-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	7,545,394	138,719	0.0184	0.9816	40.14
40.5	7,235,850	135,721	0.0188	0.9812	39.40
41.5	6,583,257	53,505	0.0081	0.9919	38.66
42.5	5,050,757	248,112	0.0491	0.9509	38.34
43.5	4,743,258	58,739	0.0124	0.9876	36.46
44.5	4,566,712	70,487	0.0154	0.9846	36.01
45.5	3,983,334	230,139	0.0578	0.9422	35.45
46.5	2,808,731	39,457	0.0140	0.9860	33.40
47.5	2,359,470	61,807	0.0262	0.9738	32.94
48.5	1,365,669	30,943	0.0227	0.9773	32.07
49.5	1,306,816	50,860	0.0389	0.9611	31.35
50.5	1,154,613	71,945	0.0623	0.9377	30.13
51.5	782,355	19,922	0.0255	0.9745	28.25
52.5	716,929	73,533	0.1026	0.8974	27.53
53.5	620,908	12,830	0.0207	0.9793	24.71
54.5	594,787	7,465	0.0126	0.9874	24.20
55.5	571,737	5,763	0.0101	0.9899	23.89
56.5	513,672	9,380	0.0183	0.9817	23.65
57.5	472,415	3,117	0.0066	0.9934	23.22
58.5	436,393	15,176	0.0348	0.9652	23.07
59.5	346,724	78,572	0.2266	0.7734	22.26
60.5	236,469	73,205	0.3096	0.6904	17.22
61.5	100,717	459	0.0046	0.9954	11.89
62.5	99,043	468	0.0047	0.9953	11.83
63.5	105,572	997	0.0094	0.9906	11.78
64.5	83,223	520	0.0062	0.9938	11.67
65.5	43,982	257	0.0058	0.9942	11.59
66.5	16,662		0.0000	1.0000	11.53
67.5	16,512		0.0000	1.0000	11.53
68.5	16,439		0.0000	1.0000	11.53
69.5	16,439	7,384	0.4492	0.5508	11.53
70.5	9,056		0.0000	1.0000	6.35
71.5	9,003		0.0000	1.0000	6.35
72.5	8,909		0.0000	1.0000	6.35
73.5	8,909		0.0000	1.0000	6.35
74.5	8,887		0.0000	1.0000	6.35
75.5	8,254		0.0000	1.0000	6.35
76.5	405		0.0000	1.0000	6.35
77.5	405		0.0000	1.0000	6.35
78.5	405		0.0000	1.0000	6.35

AMEREN MISSOURI

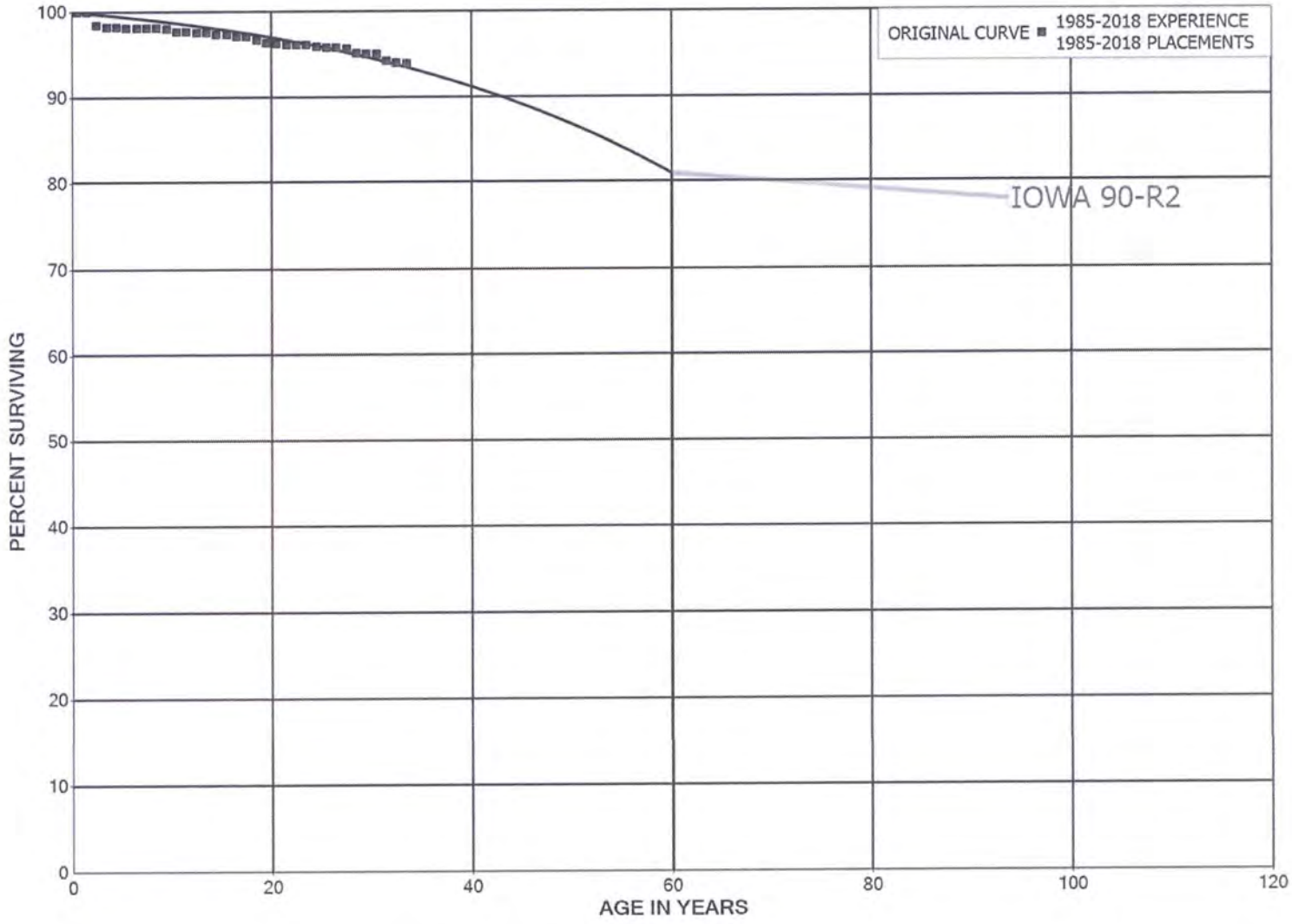
ACCOUNT 316 MISCELLANEOUS POWER PLANT EQUIPMENT

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1923-2018 EXPERIENCE BAND 1989-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
79.5	129		0.0000	1.0000	6.35
80.5	101		0.0000	1.0000	6.35
81.5	101		0.0000	1.0000	6.35
82.5	101	101	1.0000		6.35
83.5					

AMEREN MISSOURI
ACCOUNT 321 STRUCTURES AND IMPROVEMENTS
ORIGINAL AND SMOOTH SURVIVOR CURVES



AMEREN MISSOURI

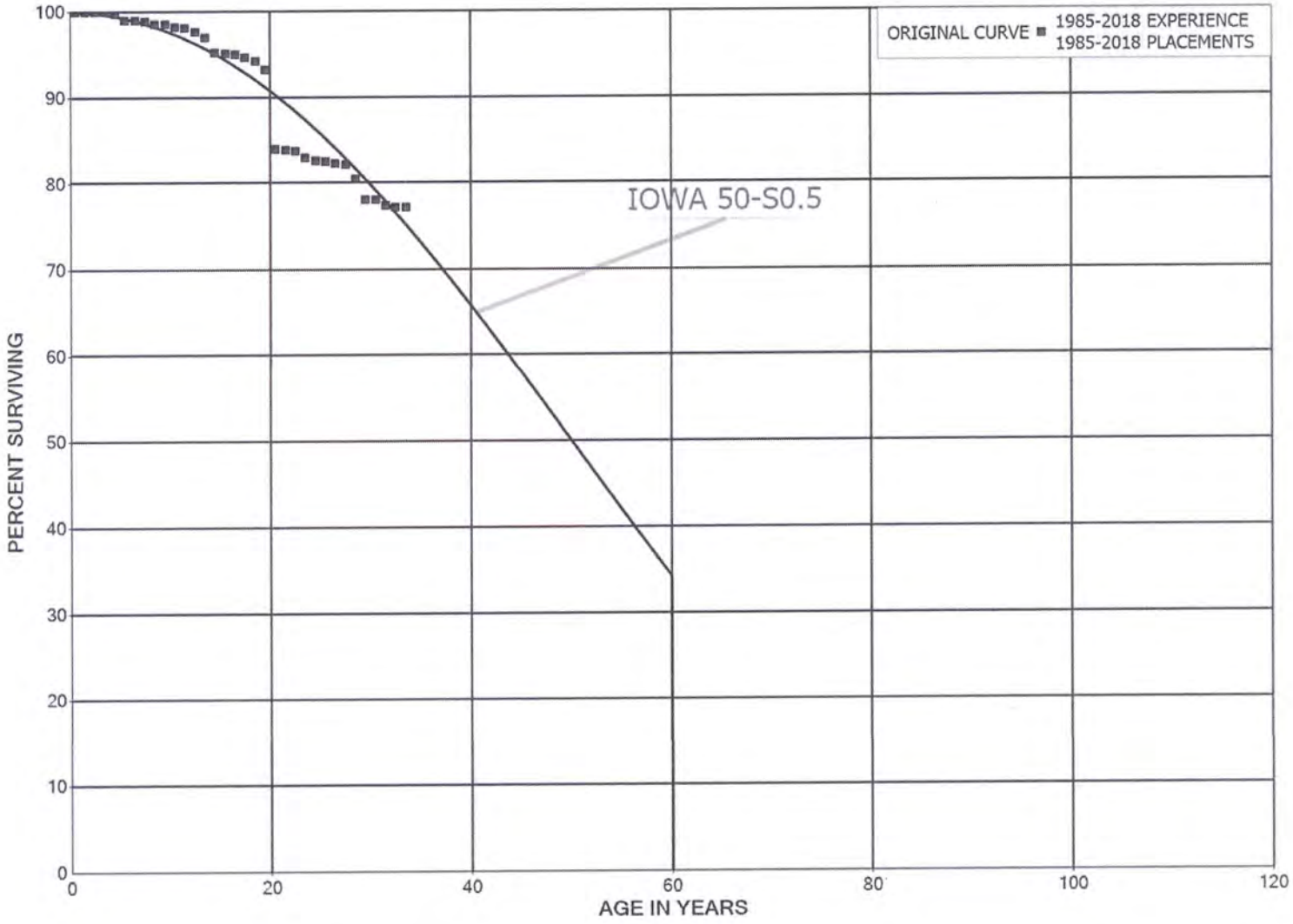
ACCOUNT 321 STRUCTURES AND IMPROVEMENTS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1985-2018 EXPERIENCE BAND 1985-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	1,019,954,959		0.0000	1.0000	100.00
0.5	1,016,470,952	199,548	0.0002	0.9998	100.00
1.5	1,013,307,799	16,137,533	0.0159	0.9841	99.98
2.5	978,846,513	2,519,652	0.0026	0.9974	98.39
3.5	968,207,940	138,267	0.0001	0.9999	98.13
4.5	953,152,584	206,661	0.0002	0.9998	98.12
5.5	946,066,562	27,512	0.0000	1.0000	98.10
6.5	945,257,586	71,982	0.0001	0.9999	98.10
7.5	942,646,817	640,671	0.0007	0.9993	98.09
8.5	937,451,727	997,968	0.0011	0.9989	98.02
9.5	926,146,116	2,984,122	0.0032	0.9968	97.92
10.5	920,483,886	92,727	0.0001	0.9999	97.60
11.5	903,059,026	1,005,739	0.0011	0.9989	97.59
12.5	898,133,969	92,619	0.0001	0.9999	97.48
13.5	889,413,906	1,636,162	0.0018	0.9982	97.47
14.5	866,171,415	530,275	0.0006	0.9994	97.29
15.5	862,328,318	1,205,181	0.0014	0.9986	97.24
16.5	859,480,002	190,141	0.0002	0.9998	97.10
17.5	858,157,706	4,405,421	0.0051	0.9949	97.08
18.5	856,459,988	3,060,702	0.0036	0.9964	96.58
19.5	852,799,502	364,878	0.0004	0.9996	96.23
20.5	850,296,825	769,638	0.0009	0.9991	96.19
21.5	849,027,655	29,925	0.0000	1.0000	96.11
22.5	848,266,765	586,085	0.0007	0.9993	96.10
23.5	846,338,983	1,930,833	0.0023	0.9977	96.04
24.5	843,969,688	538,799	0.0006	0.9994	95.82
25.5	840,348,904	292,659	0.0003	0.9997	95.76
26.5	839,251,424	575,308	0.0007	0.9993	95.72
27.5	837,986,457	5,056,088	0.0060	0.9940	95.66
28.5	826,524,798	642,945	0.0008	0.9992	95.08
29.5	825,234,283	116,486	0.0001	0.9999	95.01
30.5	824,150,806	6,795,956	0.0082	0.9918	94.99
31.5	815,185,582	2,033,337	0.0025	0.9975	94.21
32.5	809,556,028	996,810	0.0012	0.9988	93.97
33.5					93.86

AMEREN MISSOURI
ACCOUNT 322 REACTOR PLANT EQUIPMENT
ORIGINAL AND SMOOTH SURVIVOR CURVES



AMEREN MISSOURI

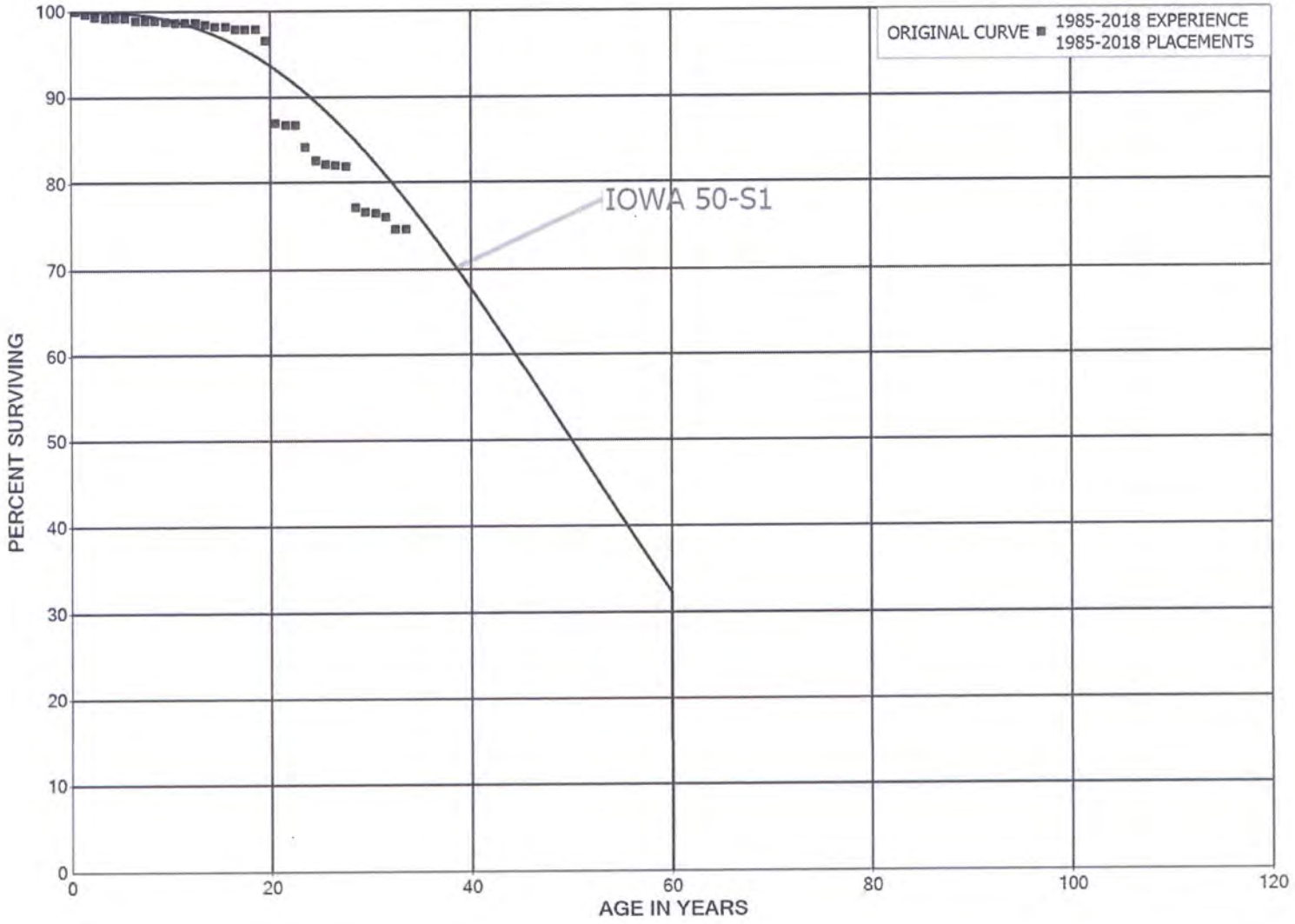
ACCOUNT 322 REACTOR PLANT EQUIPMENT

ORIGINAL LIFE TABLE

PLACEMENT BAND 1985-2018 EXPERIENCE BAND 1985-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	1,484,852,935	186,822	0.0001	0.9999	100.00
0.5	1,482,530,937	254,847	0.0002	0.9998	99.99
1.5	1,415,906,842	192,516	0.0001	0.9999	99.97
2.5	1,373,224,979	204,406	0.0001	0.9999	99.96
3.5	1,363,033,456	2,337,857	0.0017	0.9983	99.94
4.5	1,192,112,924	9,656,891	0.0081	0.9919	99.77
5.5	1,136,135,727	739,833	0.0007	0.9993	98.96
6.5	1,132,717,927	1,005,377	0.0009	0.9991	98.90
7.5	1,122,229,530	3,604,952	0.0032	0.9968	98.81
8.5	1,115,385,704	429,039	0.0004	0.9996	98.49
9.5	1,111,910,061	3,602,773	0.0032	0.9968	98.45
10.5	1,062,319,071	847,385	0.0008	0.9992	98.14
11.5	1,034,225,004	4,555,949	0.0044	0.9956	98.06
12.5	1,029,366,473	7,611,016	0.0074	0.9926	97.63
13.5	858,206,146	14,855,896	0.0173	0.9827	96.90
14.5	838,221,668	1,497,451	0.0018	0.9982	95.23
15.5	824,892,507	1,119,373	0.0014	0.9986	95.06
16.5	824,354,768	2,610,481	0.0032	0.9968	94.93
17.5	821,782,172	4,258,215	0.0052	0.9948	94.63
18.5	828,729,126	8,234,434	0.0099	0.9901	94.14
19.5	817,391,006	81,348,034	0.0995	0.9005	93.20
20.5	732,019,999	831,755	0.0011	0.9989	83.93
21.5	730,842,203	502,818	0.0007	0.9993	83.83
22.5	727,331,453	6,672,823	0.0092	0.9908	83.77
23.5	716,622,834	3,458,539	0.0048	0.9952	83.00
24.5	705,504,773	665,280	0.0009	0.9991	82.60
25.5	704,474,782	1,762,872	0.0025	0.9975	82.53
26.5	699,137,595	841,450	0.0012	0.9988	82.32
27.5	694,873,905	14,862,079	0.0214	0.9786	82.22
28.5	674,741,886	19,821,116	0.0294	0.9706	80.46
29.5	653,952,634	111,200	0.0002	0.9998	78.10
30.5	652,336,909	5,825,196	0.0089	0.9911	78.08
31.5	645,226,779	1,681,691	0.0026	0.9974	77.39
32.5	640,820,042	20,844	0.0000	1.0000	77.19
33.5					77.18

AMEREN MISSOURI
ACCOUNT 323 TURBOGENERATOR UNITS
ORIGINAL AND SMOOTH SURVIVOR CURVES



AMEREN MISSOURI

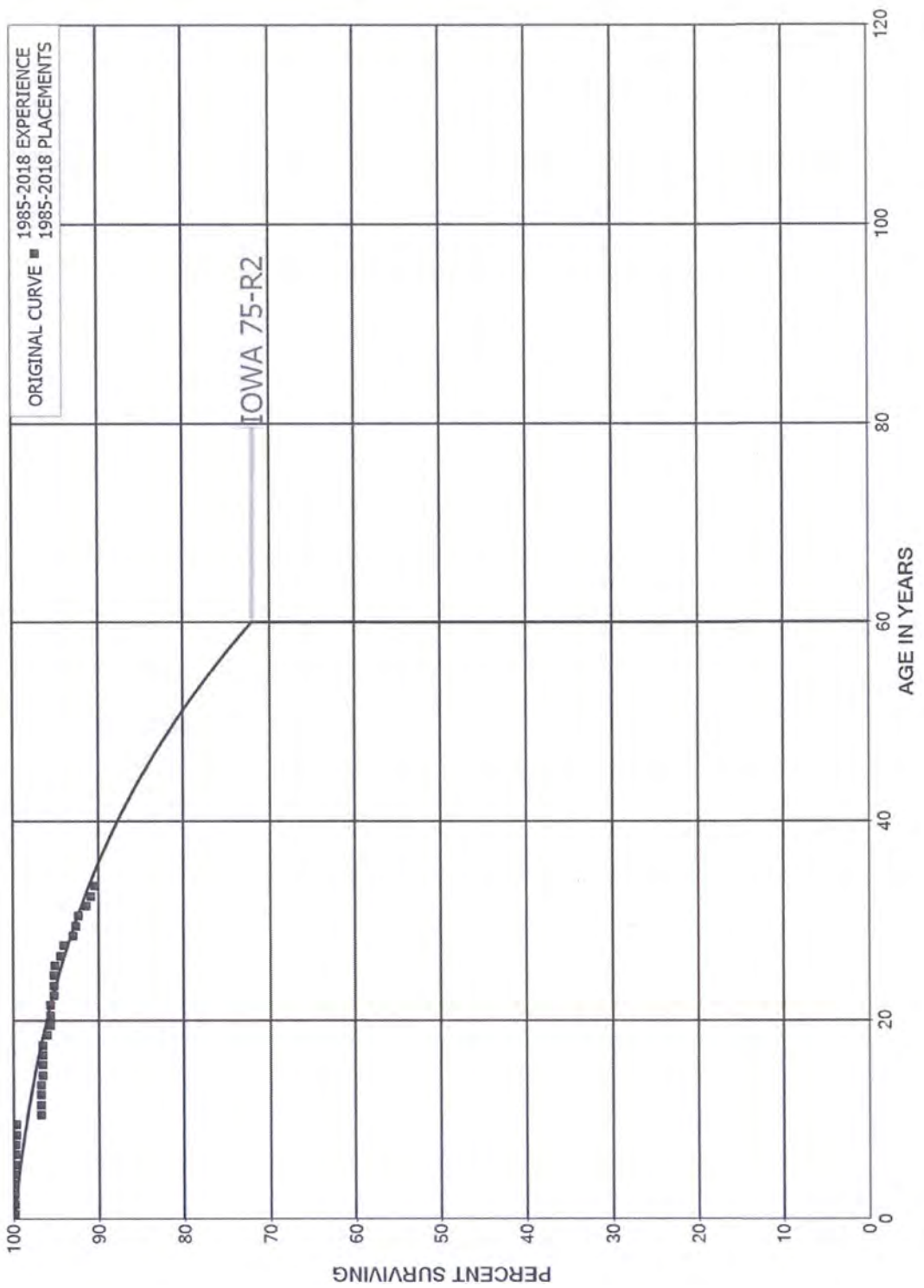
ACCOUNT 323 TURBOGENERATOR UNITS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1985-2018 EXPERIENCE BAND 1985-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	641,899,070	0	0.0000	1.0000	100.00
0.5	637,100,572	2,115,149	0.0033	0.9967	100.00
1.5	606,420,285	2,166,376	0.0036	0.9964	99.67
2.5	593,631,742	615,878	0.0010	0.9990	99.31
3.5	592,210,814	197,453	0.0003	0.9997	99.21
4.5	590,172,269	51,568	0.0001	0.9999	99.18
5.5	565,914,565	1,589,733	0.0028	0.9972	99.17
6.5	563,566,774	78,643	0.0001	0.9999	98.89
7.5	560,399,803	412,186	0.0007	0.9993	98.87
8.5	554,044,839	521,950	0.0009	0.9991	98.80
9.5	552,923,733	589,770	0.0011	0.9989	98.71
10.5	536,610,831	109,821	0.0002	0.9998	98.60
11.5	532,338,026		0.0000	1.0000	98.58
12.5	531,948,269	735,418	0.0014	0.9986	98.58
13.5	473,347,457	1,209,226	0.0026	0.9974	98.45
14.5	439,873,822	51,598	0.0001	0.9999	98.20
15.5	439,517,419	1,534,172	0.0035	0.9965	98.18
16.5	454,365,198		0.0000	1.0000	97.84
17.5	448,460,053	161,513	0.0004	0.9996	97.84
18.5	443,701,189	6,132,605	0.0138	0.9862	97.81
19.5	437,225,404	43,138,606	0.0987	0.9013	96.45
20.5	392,761,206	1,118,113	0.0028	0.9972	86.94
21.5	391,461,117	76,468	0.0002	0.9998	86.69
22.5	390,229,648	11,114,378	0.0285	0.9715	86.67
23.5	377,167,990	7,128,379	0.0189	0.9811	84.20
24.5	369,063,356	1,908,976	0.0052	0.9948	82.61
25.5	366,500,943	371,641	0.0010	0.9990	82.19
26.5	360,980,351	610,372	0.0017	0.9983	82.10
27.5	360,369,979	21,262,548	0.0590	0.9410	81.96
28.5	339,076,091	2,103,539	0.0062	0.9938	77.13
29.5	337,006,143	547,002	0.0016	0.9984	76.65
30.5	335,965,036	2,233,811	0.0066	0.9934	76.52
31.5	333,217,771	6,031,145	0.0181	0.9819	76.02
32.5	326,622,407		0.0000	1.0000	74.64
33.5					74.64

AMEREN MISSOURI
ACCOUNT 324 ACCESSORY ELECTRIC EQUIPMENT
ORIGINAL AND SMOOTH SURVIVOR CURVES



AMEREN MISSOURI

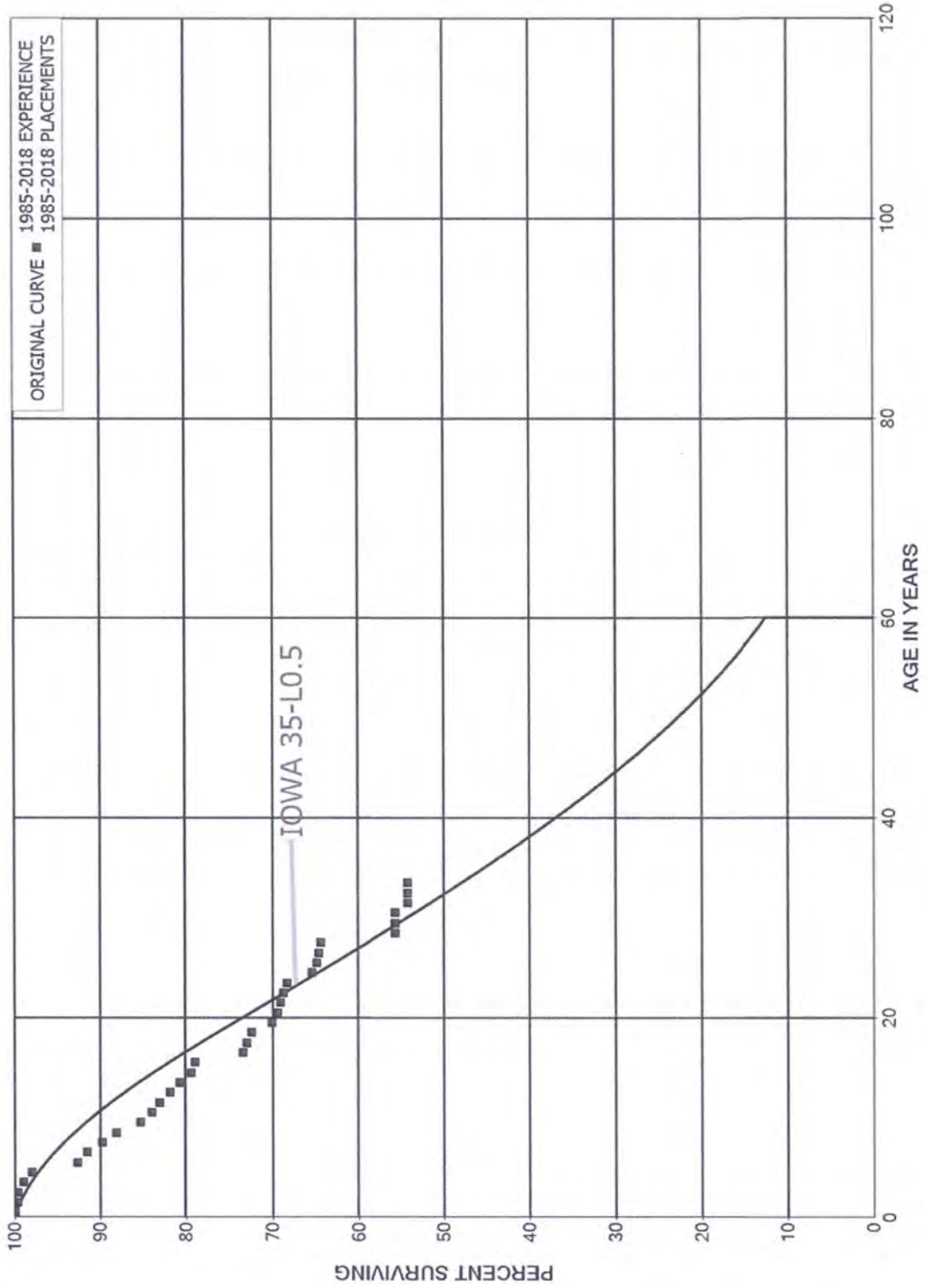
ACCOUNT 324 ACCESSORY ELECTRIC EQUIPMENT

ORIGINAL LIFE TABLE

PLACEMENT BAND 1985-2018 EXPERIENCE BAND 1985-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	318,314,023	577,362	0.0018	0.9982	100.00
0.5	316,790,888	25,459	0.0001	0.9999	99.82
1.5	302,978,149		0.0000	1.0000	99.81
2.5	281,370,745		0.0000	1.0000	99.81
3.5	280,233,614		0.0000	1.0000	99.81
4.5	268,018,164	172,168	0.0006	0.9994	99.81
5.5	264,460,775	97,940	0.0004	0.9996	99.75
6.5	264,220,865	22,562	0.0001	0.9999	99.71
7.5	245,465,336	115,380	0.0005	0.9995	99.70
8.5	240,564,405		0.0000	1.0000	99.65
9.5	241,008,650	7,135,824	0.0296	0.9704	99.65
10.5	233,872,826	1,810	0.0000	1.0000	96.70
11.5	233,739,755	32,820	0.0001	0.9999	96.70
12.5	233,458,691	20,234	0.0001	0.9999	96.69
13.5	232,772,438	342,690	0.0015	0.9985	96.68
14.5	231,809,937	1,374	0.0000	1.0000	96.54
15.5	230,100,999	1,374	0.0000	1.0000	96.54
16.5	230,068,301		0.0000	1.0000	96.54
17.5	229,783,331	1,325,032	0.0058	0.9942	96.54
18.5	203,930,535	805,448	0.0039	0.9961	95.98
19.5	203,125,087		0.0000	1.0000	95.60
20.5	203,122,992		0.0000	1.0000	95.60
21.5	203,122,992	968,903	0.0048	0.9952	95.60
22.5	202,139,344		0.0000	1.0000	95.15
23.5	201,132,932		0.0000	1.0000	95.15
24.5	200,295,642	205,875	0.0010	0.9990	95.15
25.5	200,089,767	1,355,553	0.0068	0.9932	95.05
26.5	197,504,572	602,909	0.0031	0.9969	94.40
27.5	196,901,663	2,476,931	0.0126	0.9874	94.12
28.5	194,405,673	698,395	0.0036	0.9964	92.93
29.5	195,868,210	627,879	0.0032	0.9968	92.60
30.5	195,161,572	1,927,671	0.0099	0.9901	92.30
31.5	193,114,098	1,200,598	0.0062	0.9938	91.39
32.5	191,870,072	886,001	0.0046	0.9954	90.82
33.5					90.40

AMEREN MISSOURI
ACCOUNT 325 MISCELLANEOUS POWER PLANT EQUIPMENT
ORIGINAL AND SMOOTH SURVIVOR CURVES



AMEREN MISSOURI

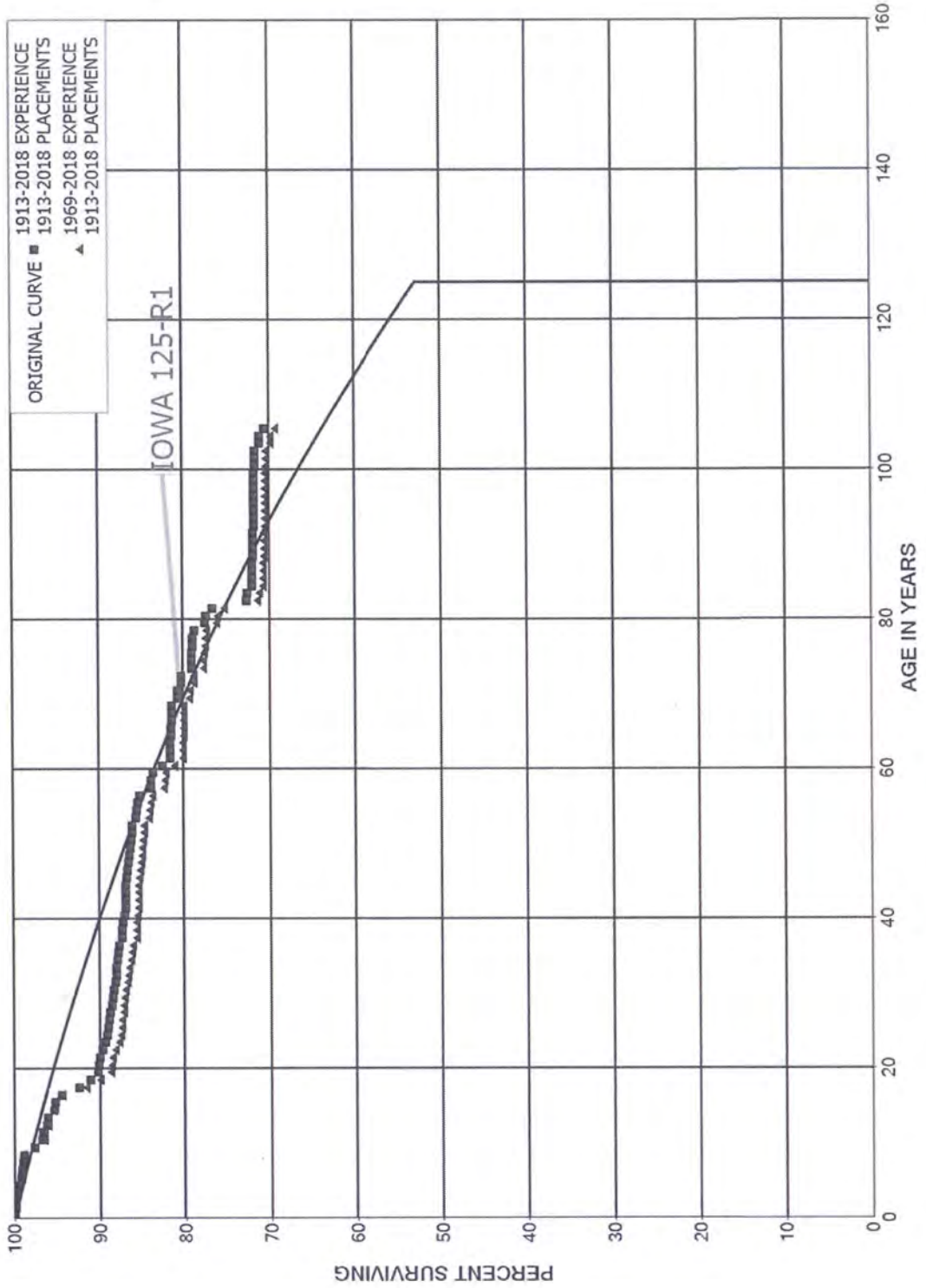
ACCOUNT 325 MISCELLANEOUS POWER PLANT EQUIPMENT

ORIGINAL LIFE TABLE

PLACEMENT BAND 1985-2018 EXPERIENCE BAND 1985-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	284,726,322	10,904	0.0000	1.0000	100.00
0.5	282,251,488	956,035	0.0034	0.9966	100.00
1.5	262,110,116	167,285	0.0006	0.9994	99.66
2.5	248,606,404	1,733,973	0.0070	0.9930	99.59
3.5	244,935,946	2,292,665	0.0094	0.9906	98.90
4.5	231,762,881	12,549,456	0.0541	0.9459	97.97
5.5	199,828,753	2,587,415	0.0129	0.9871	92.67
6.5	192,105,134	3,754,039	0.0195	0.9805	91.47
7.5	194,231,917	3,576,641	0.0184	0.9816	89.68
8.5	185,911,809	5,786,920	0.0311	0.9689	88.03
9.5	176,905,019	2,747,964	0.0155	0.9845	85.29
10.5	159,625,078	1,769,932	0.0111	0.9889	83.96
11.5	154,849,940	2,271,588	0.0147	0.9853	83.03
12.5	150,531,545	2,027,586	0.0135	0.9865	81.82
13.5	138,858,141	2,289,708	0.0165	0.9835	80.71
14.5	130,172,642	662,172	0.0051	0.9949	79.38
15.5	127,590,238	8,965,152	0.0703	0.9297	78.98
16.5	118,244,829	813,897	0.0069	0.9931	73.43
17.5	114,198,602	761,576	0.0067	0.9933	72.92
18.5	109,766,695	3,625,423	0.0330	0.9670	72.44
19.5	104,141,132	958,963	0.0092	0.9908	70.05
20.5	101,131,647	479,655	0.0047	0.9953	69.40
21.5	100,039,762	462,526	0.0046	0.9954	69.07
22.5	98,664,109	601,429	0.0061	0.9939	68.75
23.5	93,627,533	3,951,467	0.0422	0.9578	68.33
24.5	85,000,475	854,795	0.0101	0.9899	65.45
25.5	83,623,630	253,979	0.0030	0.9970	64.79
26.5	72,348,702	271,825	0.0038	0.9962	64.59
27.5	70,732,632	9,561,544	0.1352	0.8648	64.35
28.5	59,708,972	49,440	0.0008	0.9992	55.65
29.5	59,312,546		0.0000	1.0000	55.61
30.5	56,671,358	1,468,977	0.0259	0.9741	55.61
31.5	53,372,273		0.0000	1.0000	54.16
32.5	51,613,701		0.0000	1.0000	54.16
33.5					54.16

AMEREN MISSOURI
ACCOUNT 331 STRUCTURES AND IMPROVEMENTS
ORIGINAL AND SMOOTH SURVIVOR CURVES



AMEREN MISSOURI

ACCOUNT 331 STRUCTURES AND IMPROVEMENTS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1913-2018 EXPERIENCE BAND 1913-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	58,050,095	899	0.0000	1.0000	100.00
0.5	53,428,869	88,855	0.0017	0.9983	100.00
1.5	52,271,699	9,873	0.0002	0.9998	99.83
2.5	47,944,750	53,850	0.0011	0.9989	99.81
3.5	45,662,696	100,412	0.0022	0.9978	99.70
4.5	34,281,929	110,880	0.0032	0.9968	99.48
5.5	30,814,015	28,792	0.0009	0.9991	99.16
6.5	30,071,623	51,444	0.0017	0.9983	99.07
7.5	29,240,414	21,323	0.0007	0.9993	98.90
8.5	19,444,348	241,822	0.0124	0.9876	98.83
9.5	16,542,389	143,505	0.0087	0.9913	97.60
10.5	15,455,925	15,982	0.0010	0.9990	96.75
11.5	14,402,677	70,350	0.0049	0.9951	96.65
12.5	14,270,344	16,389	0.0011	0.9989	96.18
13.5	13,408,380	102,729	0.0077	0.9923	96.07
14.5	13,195,359	16,629	0.0013	0.9987	95.33
15.5	13,076,907	108,917	0.0083	0.9917	95.21
16.5	12,381,772	271,044	0.0219	0.9781	94.42
17.5	12,078,703	167,848	0.0139	0.9861	92.35
18.5	11,768,597	117,116	0.0100	0.9900	91.07
19.5	11,519,983	10,132	0.0009	0.9991	90.16
20.5	11,444,091	14,377	0.0013	0.9987	90.08
21.5	11,361,076	38,955	0.0034	0.9966	89.97
22.5	11,216,679	43,047	0.0038	0.9962	89.66
23.5	10,932,262	35,248	0.0032	0.9968	89.32
24.5	10,589,531	9,704	0.0009	0.9991	89.03
25.5	10,412,057	9,599	0.0009	0.9991	88.95
26.5	10,067,979	16,424	0.0016	0.9984	88.87
27.5	10,016,935	24,463	0.0024	0.9976	88.72
28.5	9,878,004	12,558	0.0013	0.9987	88.50
29.5	9,847,887	10,920	0.0011	0.9989	88.39
30.5	9,824,993	25,400	0.0026	0.9974	88.29
31.5	9,791,847	8,611	0.0009	0.9991	88.06
32.5	9,708,010	7,679	0.0008	0.9992	87.99
33.5	9,461,623	14,072	0.0015	0.9985	87.92
34.5	9,330,963	11,343	0.0012	0.9988	87.79
35.5	9,311,253	5,608	0.0006	0.9994	87.68
36.5	9,250,705	32,121	0.0035	0.9965	87.63
37.5	9,182,052	5,941	0.0006	0.9994	87.32
38.5	9,058,962	12,368	0.0014	0.9986	87.27

AMEREN MISSOURI

ACCOUNT 331 STRUCTURES AND IMPROVEMENTS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1913-2018 EXPERIENCE BAND 1913-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	9,044,143	14,759	0.0016	0.9984	87.15
40.5	8,920,563	12,885	0.0014	0.9986	87.01
41.5	8,888,895	2,653	0.0003	0.9997	86.88
42.5	8,849,639	1,112	0.0001	0.9999	86.85
43.5	8,775,720	4,012	0.0005	0.9995	86.84
44.5	8,718,494	2,530	0.0003	0.9997	86.80
45.5	8,610,341	13,858	0.0016	0.9984	86.78
46.5	8,531,206	11,218	0.0013	0.9987	86.64
47.5	8,325,978	12,667	0.0015	0.9985	86.52
48.5	8,308,249	10,449	0.0013	0.9987	86.39
49.5	8,292,566	8,963	0.0011	0.9989	86.28
50.5	8,137,615	7,231	0.0009	0.9991	86.19
51.5	8,129,756	443	0.0001	0.9999	86.11
52.5	8,116,318	45,282	0.0056	0.9944	86.11
53.5	8,021,747	10,560	0.0013	0.9987	85.63
54.5	7,977,058	10,044	0.0013	0.9987	85.52
55.5	4,001,787	8,654	0.0022	0.9978	85.41
56.5	3,981,320	65,776	0.0165	0.9835	85.22
57.5	3,850,937	1,467	0.0004	0.9996	83.82
58.5	3,843,382	7,802	0.0020	0.9980	83.78
59.5	3,829,422	48,490	0.0127	0.9873	83.61
60.5	3,727,618	42,626	0.0114	0.9886	82.56
61.5	3,666,248	322	0.0001	0.9999	81.61
62.5	3,638,008	1,608	0.0004	0.9996	81.60
63.5	3,601,849	2,394	0.0007	0.9993	81.57
64.5	3,562,724	2,239	0.0006	0.9994	81.51
65.5	3,302,883	767	0.0002	0.9998	81.46
66.5	3,082,441	44	0.0000	1.0000	81.44
67.5	3,009,978		0.0000	1.0000	81.44
68.5	2,999,762	25,536	0.0085	0.9915	81.44
69.5	2,965,506	1,047	0.0004	0.9996	80.75
70.5	2,953,079	17,794	0.0060	0.9940	80.72
71.5	2,935,285	98	0.0000	1.0000	80.23
72.5	2,935,187	42,961	0.0146	0.9854	80.23
73.5	2,889,271	41	0.0000	1.0000	79.06
74.5	2,808,758	1,288	0.0005	0.9995	79.06
75.5	2,804,516	4,108	0.0015	0.9985	79.02
76.5	2,800,409	391	0.0001	0.9999	78.90
77.5	2,798,036	5,154	0.0018	0.9982	78.89
78.5	2,788,540	44,826	0.0161	0.9839	78.75

AMEREN MISSOURI

ACCOUNT 331 STRUCTURES AND IMPROVEMENTS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1913-2018 EXPERIENCE BAND 1913-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
79.5	2,742,359	1,445	0.0005	0.9995	77.48
80.5	2,739,675	29,812	0.0109	0.9891	77.44
81.5	2,707,000	141,265	0.0522	0.9478	76.60
82.5	2,565,645	5,032	0.0020	0.9980	72.60
83.5	2,558,727	16,858	0.0066	0.9934	72.46
84.5	2,543,762		0.0000	1.0000	71.98
85.5	2,543,762		0.0000	1.0000	71.98
86.5	2,521,225	2,763	0.0011	0.9989	71.98
87.5	1,460,021	370	0.0003	0.9997	71.90
88.5	1,168,333		0.0000	1.0000	71.88
89.5	1,163,237		0.0000	1.0000	71.88
90.5	1,163,237		0.0000	1.0000	71.88
91.5	1,161,820	3,038	0.0026	0.9974	71.88
92.5	1,158,782		0.0000	1.0000	71.70
93.5	1,156,447		0.0000	1.0000	71.70
94.5	1,156,447		0.0000	1.0000	71.70
95.5	1,156,447		0.0000	1.0000	71.70
96.5	1,156,447		0.0000	1.0000	71.70
97.5	1,156,447		0.0000	1.0000	71.70
98.5	1,156,447		0.0000	1.0000	71.70
99.5	1,156,447	2,001	0.0017	0.9983	71.70
100.5	1,153,984		0.0000	1.0000	71.57
101.5	1,150,441		0.0000	1.0000	71.57
102.5	1,150,441	7,689	0.0067	0.9933	71.57
103.5	1,127,023		0.0000	1.0000	71.09
104.5	1,124,722	9,463	0.0084	0.9916	71.09
105.5					70.50

AMEREN MISSOURI

ACCOUNT 331 STRUCTURES AND IMPROVEMENTS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1913-2018 EXPERIENCE BAND 1969-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	48,766,549		0.0000	1.0000	100.00
0.5	44,150,466	82,547	0.0019	0.9981	100.00
1.5	43,136,349	3,334	0.0001	0.9999	99.81
2.5	38,847,785	52,350	0.0013	0.9987	99.81
3.5	36,780,562	97,226	0.0026	0.9974	99.67
4.5	25,465,619	101,999	0.0040	0.9960	99.41
5.5	26,336,484	15,830	0.0006	0.9994	99.01
6.5	25,630,969	23,226	0.0009	0.9991	98.95
7.5	24,919,814	17,517	0.0007	0.9993	98.86
8.5	15,133,979	218,548	0.0144	0.9856	98.79
9.5	12,291,727	132,679	0.0108	0.9892	97.36
10.5	11,266,346	1,574	0.0001	0.9999	96.31
11.5	10,248,173	53,696	0.0052	0.9948	96.30
12.5	10,176,285	445	0.0000	1.0000	95.79
13.5	9,377,081	48,182	0.0051	0.9949	95.79
14.5	9,268,386	11,438	0.0012	0.9988	95.30
15.5	9,508,593	102,211	0.0107	0.9893	95.18
16.5	9,050,273	264,742	0.0293	0.9707	94.16
17.5	8,827,239	160,094	0.0181	0.9819	91.40
18.5	8,537,656	116,731	0.0137	0.9863	89.75
19.5	8,300,155	6,660	0.0008	0.9992	88.52
20.5	8,252,523	12,076	0.0015	0.9985	88.45
21.5	8,172,811	30,515	0.0037	0.9963	88.32
22.5	8,037,098	42,870	0.0053	0.9947	87.99
23.5	7,773,739	25,324	0.0033	0.9967	87.52
24.5	7,530,185	1,311	0.0002	0.9998	87.23
25.5	7,364,951	4,753	0.0006	0.9994	87.22
26.5	7,025,751	13,403	0.0019	0.9981	87.16
27.5	6,980,999	3,642	0.0005	0.9995	87.00
28.5	6,869,044	6,737	0.0010	0.9990	86.95
29.5	6,846,494	10,348	0.0015	0.9985	86.87
30.5	6,832,558	21,956	0.0032	0.9968	86.73
31.5	6,811,057	8,438	0.0012	0.9988	86.46
32.5	6,728,049	7,590	0.0011	0.9989	86.35
33.5	6,486,520	11,605	0.0018	0.9982	86.25
34.5	6,358,647	11,343	0.0018	0.9982	86.10
35.5	6,342,813	5,608	0.0009	0.9991	85.94
36.5	6,376,000	31,029	0.0049	0.9951	85.87
37.5	7,629,791	3,767	0.0005	0.9995	85.45
38.5	7,774,077	1,366	0.0002	0.9998	85.41

AMEREN MISSOURI

ACCOUNT 331 STRUCTURES AND IMPROVEMENTS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1913-2018 EXPERIENCE BAND 1969-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	7,775,357	12,680	0.0016	0.9984	85.39
40.5	7,653,856	6,960	0.0009	0.9991	85.25
41.5	7,629,530	1,397	0.0002	0.9998	85.18
42.5	7,591,531	722	0.0001	0.9999	85.16
43.5	7,520,336	1,718	0.0002	0.9998	85.15
44.5	7,465,404	1,307	0.0002	0.9998	85.13
45.5	7,358,474	13,858	0.0019	0.9981	85.12
46.5	7,279,339	10,229	0.0014	0.9986	84.96
47.5	7,075,100	7,749	0.0011	0.9989	84.84
48.5	7,062,289	4,510	0.0006	0.9994	84.74
49.5	7,052,545	8,759	0.0012	0.9988	84.69
50.5	6,898,260	6,574	0.0010	0.9990	84.59
51.5	6,892,709	270	0.0000	1.0000	84.50
52.5	6,879,814	44,762	0.0065	0.9935	84.50
53.5	6,801,491	10,560	0.0016	0.9984	83.95
54.5	6,759,103	10,044	0.0015	0.9985	83.82
55.5	4,001,787	8,654	0.0022	0.9978	83.70
56.5	3,981,320	65,776	0.0165	0.9835	83.52
57.5	3,850,937	1,467	0.0004	0.9996	82.14
58.5	3,843,382	7,802	0.0020	0.9980	82.10
59.5	3,829,422	48,490	0.0127	0.9873	81.94
60.5	3,727,618	42,626	0.0114	0.9886	80.90
61.5	3,666,248	322	0.0001	0.9999	79.98
62.5	3,638,008	1,608	0.0004	0.9996	79.97
63.5	3,601,849	2,394	0.0007	0.9993	79.93
64.5	3,562,724	2,239	0.0006	0.9994	79.88
65.5	3,302,883	767	0.0002	0.9998	79.83
66.5	3,082,441	44	0.0000	1.0000	79.81
67.5	3,009,978		0.0000	1.0000	79.81
68.5	2,999,762	25,536	0.0085	0.9915	79.81
69.5	2,965,506	1,047	0.0004	0.9996	79.13
70.5	2,953,079	17,794	0.0060	0.9940	79.10
71.5	2,935,285	98	0.0000	1.0000	78.63
72.5	2,935,187	42,961	0.0146	0.9854	78.62
73.5	2,889,271	41	0.0000	1.0000	77.47
74.5	2,808,758	1,288	0.0005	0.9995	77.47
75.5	2,804,516	4,108	0.0015	0.9985	77.44
76.5	2,800,409	391	0.0001	0.9999	77.32
77.5	2,798,036	5,154	0.0018	0.9982	77.31
78.5	2,788,540	44,826	0.0161	0.9839	77.17

AMEREN MISSOURI

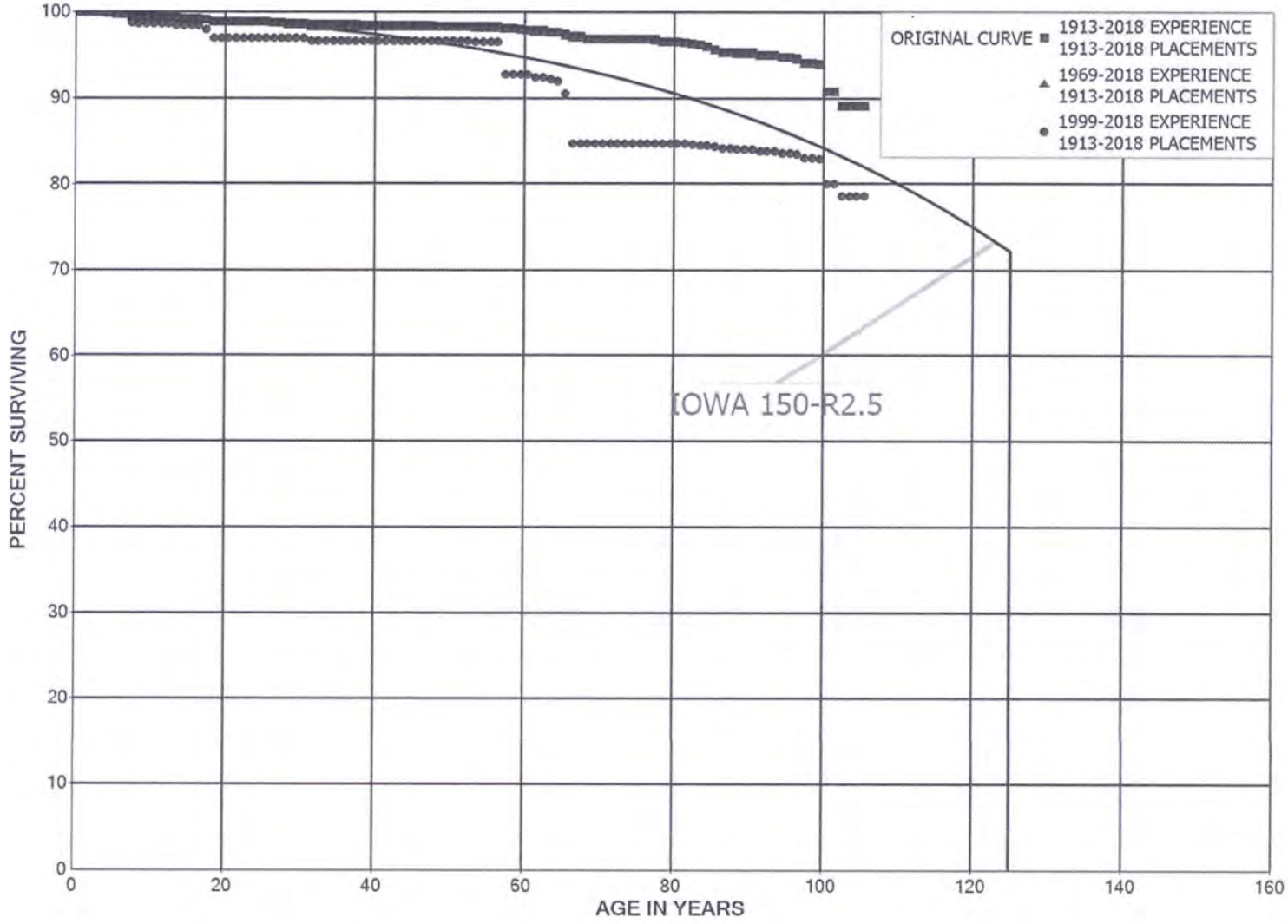
ACCOUNT 331 STRUCTURES AND IMPROVEMENTS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1913-2018 EXPERIENCE BAND 1969-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
79.5	2,742,359	1,445	0.0005	0.9995	75.93
80.5	2,739,675	29,812	0.0109	0.9891	75.89
81.5	2,707,000	141,265	0.0522	0.9478	75.06
82.5	2,565,645	5,032	0.0020	0.9980	71.15
83.5	2,558,727	16,858	0.0066	0.9934	71.01
84.5	2,543,762		0.0000	1.0000	70.54
85.5	2,543,762		0.0000	1.0000	70.54
86.5	2,521,225	2,763	0.0011	0.9989	70.54
87.5	1,460,021	370	0.0003	0.9997	70.46
88.5	1,168,333		0.0000	1.0000	70.44
89.5	1,163,237		0.0000	1.0000	70.44
90.5	1,163,237		0.0000	1.0000	70.44
91.5	1,161,820	3,038	0.0026	0.9974	70.44
92.5	1,158,782		0.0000	1.0000	70.26
93.5	1,156,447		0.0000	1.0000	70.26
94.5	1,156,447		0.0000	1.0000	70.26
95.5	1,156,447		0.0000	1.0000	70.26
96.5	1,156,447		0.0000	1.0000	70.26
97.5	1,156,447		0.0000	1.0000	70.26
98.5	1,156,447		0.0000	1.0000	70.26
99.5	1,156,447	2,001	0.0017	0.9983	70.26
100.5	1,153,984		0.0000	1.0000	70.14
101.5	1,150,441		0.0000	1.0000	70.14
102.5	1,150,441	7,689	0.0067	0.9933	70.14
103.5	1,127,023		0.0000	1.0000	69.67
104.5	1,124,722	9,463	0.0084	0.9916	69.67
105.5					69.08

AMEREN MISSOURI
ACCOUNT 332 RESERVOIRS, DAMS AND WATERWAYS
ORIGINAL AND SMOOTH SURVIVOR CURVES



AMEREN MISSOURI

ACCOUNT 332 RESERVOIRS, DAMS AND WATERWAYS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1913-2018 EXPERIENCE BAND 1913-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	137,210,191	18,611	0.0001	0.9999	100.00
0.5	81,294,541	6,356	0.0001	0.9999	99.99
1.5	81,061,215	3,655	0.0000	1.0000	99.98
2.5	79,819,957	25,674	0.0003	0.9997	99.97
3.5	79,871,411	68,298	0.0009	0.9991	99.94
4.5	78,865,162	61,957	0.0008	0.9992	99.86
5.5	78,273,589	11,120	0.0001	0.9999	99.78
6.5	77,021,577	245,641	0.0032	0.9968	99.76
7.5	76,587,686	70,610	0.0009	0.9991	99.45
8.5	75,677,214	2,954	0.0000	1.0000	99.35
9.5	68,743,639	3,838	0.0001	0.9999	99.35
10.5	63,900,970	7,534	0.0001	0.9999	99.34
11.5	63,320,794	14,446	0.0002	0.9998	99.33
12.5	61,194,991	24,375	0.0004	0.9996	99.31
13.5	59,343,045	33,354	0.0006	0.9994	99.27
14.5	58,446,411	2,699	0.0000	1.0000	99.21
15.5	58,337,637	8,381	0.0001	0.9999	99.21
16.5	58,325,055	66,297	0.0011	0.9989	99.20
17.5	58,237,192	149,273	0.0026	0.9974	99.08
18.5	58,078,486	554	0.0000	1.0000	98.83
19.5	58,209,429	224	0.0000	1.0000	98.83
20.5	58,175,507		0.0000	1.0000	98.83
21.5	58,111,676	249	0.0000	1.0000	98.83
22.5	57,963,775		0.0000	1.0000	98.83
23.5	57,698,918		0.0000	1.0000	98.83
24.5	57,211,570	2,213	0.0000	1.0000	98.83
25.5	57,163,201	46,215	0.0008	0.9992	98.82
26.5	54,984,127	167	0.0000	1.0000	98.74
27.5	54,823,652	55,238	0.0010	0.9990	98.74
28.5	54,450,887	465	0.0000	1.0000	98.64
29.5	53,472,145	1,637	0.0000	1.0000	98.64
30.5	53,337,948	71,473	0.0013	0.9987	98.64
31.5	52,320,913	830	0.0000	1.0000	98.51
32.5	52,307,652	10,491	0.0002	0.9998	98.51
33.5	52,334,352	17,206	0.0003	0.9997	98.49
34.5	52,300,468	1,736	0.0000	1.0000	98.45
35.5	52,293,764		0.0000	1.0000	98.45
36.5	42,738,159		0.0000	1.0000	98.45
37.5	42,723,996	2,199	0.0001	0.9999	98.45
38.5	42,314,028	9,970	0.0002	0.9998	98.45

AMEREN MISSOURI

ACCOUNT 332 RESERVOIRS, DAMS AND WATERWAYS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1913-2018 EXPERIENCE BAND 1913-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	42,247,199	459	0.0000	1.0000	98.42
40.5	42,038,067	6,521	0.0002	0.9998	98.42
41.5	41,831,355	1,222	0.0000	1.0000	98.41
42.5	41,825,812		0.0000	1.0000	98.40
43.5	41,820,363	2,149	0.0001	0.9999	98.40
44.5	41,788,402	3,120	0.0001	0.9999	98.40
45.5	41,782,774		0.0000	1.0000	98.39
46.5	41,755,167	13,202	0.0003	0.9997	98.39
47.5	41,597,959	14,951	0.0004	0.9996	98.36
48.5	41,213,009		0.0000	1.0000	98.32
49.5	40,622,528		0.0000	1.0000	98.32
50.5	26,754,501	5,953	0.0002	0.9998	98.32
51.5	26,523,686	1,768	0.0001	0.9999	98.30
52.5	26,527,292	5,763	0.0002	0.9998	98.30
53.5	26,508,146	105	0.0000	1.0000	98.27
54.5	26,110,130	5,120	0.0002	0.9998	98.27
55.5	20,003,403		0.0000	1.0000	98.26
56.5	19,985,437	32,264	0.0016	0.9984	98.26
57.5	19,973,508	8,544	0.0004	0.9996	98.10
58.5	19,959,258	23,812	0.0012	0.9988	98.05
59.5	19,914,423	22,213	0.0011	0.9989	97.94
60.5	19,901,018	2,856	0.0001	0.9999	97.83
61.5	19,880,280		0.0000	1.0000	97.81
62.5	19,878,645	35,802	0.0018	0.9982	97.81
63.5	19,831,199	1,299	0.0001	0.9999	97.64
64.5	19,816,219	54,525	0.0028	0.9972	97.63
65.5	19,746,366	44,417	0.0022	0.9978	97.36
66.5	19,674,083		0.0000	1.0000	97.14
67.5	19,362,571	55,385	0.0029	0.9971	97.14
68.5	19,225,472		0.0000	1.0000	96.87
69.5	19,177,781		0.0000	1.0000	96.87
70.5	19,174,972		0.0000	1.0000	96.87
71.5	19,172,095	251	0.0000	1.0000	96.87
72.5	19,168,841	352	0.0000	1.0000	96.87
73.5	19,158,857	5,094	0.0003	0.9997	96.86
74.5	19,153,645		0.0000	1.0000	96.84
75.5	19,153,418		0.0000	1.0000	96.84
76.5	19,153,418	9,987	0.0005	0.9995	96.84
77.5	19,143,431	55,120	0.0029	0.9971	96.79
78.5	18,942,949	751	0.0000	1.0000	96.51

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ACCOUNT 332 RESERVOIRS, DAMS AND WATERWAYS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1913-2018 EXPERIENCE BAND 1913-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
79.5	18,937,804		0.0000	1.0000	96.50
80.5	18,930,359	14,532	0.0008	0.9992	96.50
81.5	18,945,050	25,488	0.0013	0.9987	96.43
82.5	18,887,302	19,293	0.0010	0.9990	96.30
83.5	18,865,819	51,546	0.0027	0.9973	96.20
84.5	18,818,381	66,423	0.0035	0.9965	95.94
85.5	18,750,655	59,167	0.0032	0.9968	95.60
86.5	18,689,566		0.0000	1.0000	95.30
87.5	16,882,281	9,632	0.0006	0.9994	95.30
88.5	4,897,455		0.0000	1.0000	95.24
89.5	4,606,648		0.0000	1.0000	95.24
90.5	4,602,151	11,482	0.0025	0.9975	95.24
91.5	4,515,336		0.0000	1.0000	95.01
92.5	4,479,835	530	0.0001	0.9999	95.01
93.5	4,449,580	11,482	0.0026	0.9974	95.00
94.5	4,430,472	1,131	0.0003	0.9997	94.75
95.5	4,406,448	6,477	0.0015	0.9985	94.73
96.5	4,386,000	22,964	0.0052	0.9948	94.59
97.5	4,363,036		0.0000	1.0000	94.09
98.5	4,369,145	6,495	0.0015	0.9985	94.09
99.5	4,362,650	151,185	0.0347	0.9653	93.95
100.5	4,206,551		0.0000	1.0000	90.70
101.5	4,202,077	73,379	0.0175	0.9825	90.70
102.5	4,114,209	1,096	0.0003	0.9997	89.11
103.5	4,113,113		0.0000	1.0000	89.09
104.5	4,018,842		0.0000	1.0000	89.09
105.5					89.09

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ACCOUNT 332 RESERVOIRS, DAMS AND WATERWAYS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1913-2018 EXPERIENCE BAND 1969-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	95,029,457		0.0000	1.0000	100.00
0.5	39,143,962		0.0000	1.0000	100.00
1.5	39,145,387	48	0.0000	1.0000	100.00
2.5	37,918,900	1	0.0000	1.0000	100.00
3.5	38,369,320	68,051	0.0018	0.9982	100.00
4.5	38,424,939	54,595	0.0014	0.9986	99.82
5.5	57,994,534		0.0000	1.0000	99.68
6.5	56,771,784	222,065	0.0039	0.9961	99.68
7.5	56,379,405	52,010	0.0009	0.9991	99.29
8.5	55,538,687	2,420	0.0000	1.0000	99.20
9.5	48,620,573		0.0000	1.0000	99.19
10.5	43,783,399		0.0000	1.0000	99.19
11.5	43,247,666		0.0000	1.0000	99.19
12.5	41,137,944	19,239	0.0005	0.9995	99.19
13.5	39,319,576	3,319	0.0001	0.9999	99.15
14.5	38,466,658	1,048	0.0000	1.0000	99.14
15.5	38,380,837	3,656	0.0001	0.9999	99.14
16.5	38,415,284	65,289	0.0017	0.9983	99.13
17.5	38,643,715	149,273	0.0039	0.9961	98.96
18.5	38,568,414		0.0000	1.0000	98.58
19.5	38,740,539	117	0.0000	1.0000	98.58
20.5	38,706,724		0.0000	1.0000	98.58
21.5	38,647,934		0.0000	1.0000	98.58
22.5	38,503,403		0.0000	1.0000	98.58
23.5	38,238,545		0.0000	1.0000	98.58
24.5	37,752,898	2,140	0.0001	0.9999	98.58
25.5	37,707,843	45,915	0.0012	0.9988	98.57
26.5	35,530,229		0.0000	1.0000	98.45
27.5	35,373,656	55,238	0.0016	0.9984	98.45
28.5	35,146,605		0.0000	1.0000	98.30
29.5	34,171,286		0.0000	1.0000	98.30
30.5	34,041,362	71,240	0.0021	0.9979	98.30
31.5	33,025,684		0.0000	1.0000	98.09
32.5	33,047,583	8,946	0.0003	0.9997	98.09
33.5	33,078,243	182	0.0000	1.0000	98.07
34.5	33,061,383		0.0000	1.0000	98.06
35.5	33,057,718		0.0000	1.0000	98.06
36.5	23,504,037		0.0000	1.0000	98.06
37.5	25,304,773	0	0.0000	1.0000	98.06
38.5	36,924,974	3,126	0.0001	0.9999	98.06

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ACCOUNT 332 RESERVOIRS, DAMS AND WATERWAYS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1913-2018 EXPERIENCE BAND 1969-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	37,158,799		0.0000	1.0000	98.06
40.5	36,964,255	3,287	0.0001	0.9999	98.06
41.5	36,814,613		0.0000	1.0000	98.05
42.5	36,845,793		0.0000	1.0000	98.05
43.5	36,870,069	1,293	0.0000	1.0000	98.05
44.5	36,846,590	3,120	0.0001	0.9999	98.04
45.5	36,863,854		0.0000	1.0000	98.04
46.5	36,855,426		0.0000	1.0000	98.04
47.5	36,716,229		0.0000	1.0000	98.04
48.5	36,359,624		0.0000	1.0000	98.04
49.5	35,769,143		0.0000	1.0000	98.04
50.5	21,907,161		0.0000	1.0000	98.04
51.5	21,704,263	1,582	0.0001	0.9999	98.04
52.5	21,722,545	5,763	0.0003	0.9997	98.03
53.5	21,703,399	105	0.0000	1.0000	98.00
54.5	21,485,314	2,143	0.0001	0.9999	98.00
55.5	20,003,403		0.0000	1.0000	97.99
56.5	19,985,437	32,264	0.0016	0.9984	97.99
57.5	19,973,508	8,544	0.0004	0.9996	97.83
58.5	19,959,258	23,812	0.0012	0.9988	97.79
59.5	19,914,423	22,213	0.0011	0.9989	97.68
60.5	19,901,018	2,856	0.0001	0.9999	97.57
61.5	19,880,280		0.0000	1.0000	97.55
62.5	19,878,645	35,802	0.0018	0.9982	97.55
63.5	19,831,199	1,299	0.0001	0.9999	97.38
64.5	19,816,219	54,525	0.0028	0.9972	97.37
65.5	19,746,366	44,417	0.0022	0.9978	97.10
66.5	19,674,083		0.0000	1.0000	96.88
67.5	19,362,571	55,385	0.0029	0.9971	96.88
68.5	19,225,472		0.0000	1.0000	96.61
69.5	19,177,781		0.0000	1.0000	96.61
70.5	19,174,972		0.0000	1.0000	96.61
71.5	19,172,095	251	0.0000	1.0000	96.61
72.5	19,168,841	352	0.0000	1.0000	96.61
73.5	19,158,857	5,094	0.0003	0.9997	96.60
74.5	19,153,645		0.0000	1.0000	96.58
75.5	19,153,418		0.0000	1.0000	96.58
76.5	19,153,418	9,987	0.0005	0.9995	96.58
77.5	19,143,431	55,120	0.0029	0.9971	96.53
78.5	18,942,949	751	0.0000	1.0000	96.25

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ACCOUNT 332 RESERVOIRS, DAMS AND WATERWAYS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1913-2018 EXPERIENCE BAND 1969-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
79.5	18,937,804		0.0000	1.0000	96.25
80.5	18,930,359	14,532	0.0008	0.9992	96.25
81.5	18,945,050	25,488	0.0013	0.9987	96.17
82.5	18,887,302	19,293	0.0010	0.9990	96.04
83.5	18,865,819	51,546	0.0027	0.9973	95.95
84.5	18,818,381	66,423	0.0035	0.9965	95.68
85.5	18,750,655	59,167	0.0032	0.9968	95.35
86.5	18,689,566		0.0000	1.0000	95.04
87.5	16,882,281	9,632	0.0006	0.9994	95.04
88.5	4,897,455		0.0000	1.0000	94.99
89.5	4,606,648		0.0000	1.0000	94.99
90.5	4,602,151	11,482	0.0025	0.9975	94.99
91.5	4,515,336		0.0000	1.0000	94.75
92.5	4,479,835	530	0.0001	0.9999	94.75
93.5	4,449,580	11,482	0.0026	0.9974	94.74
94.5	4,430,472	1,131	0.0003	0.9997	94.50
95.5	4,406,448	6,477	0.0015	0.9985	94.47
96.5	4,386,000	22,964	0.0052	0.9948	94.33
97.5	4,363,036		0.0000	1.0000	93.84
98.5	4,369,145	6,495	0.0015	0.9985	93.84
99.5	4,362,650	151,185	0.0347	0.9653	93.70
100.5	4,206,551		0.0000	1.0000	90.45
101.5	4,202,077	73,379	0.0175	0.9825	90.45
102.5	4,114,209	1,096	0.0003	0.9997	88.87
103.5	4,113,113		0.0000	1.0000	88.85
104.5	4,018,842		0.0000	1.0000	88.85
105.5					88.85

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ACCOUNT 332 RESERVOIRS, DAMS AND WATERWAYS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1913-2018 EXPERIENCE BAND 1999-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	78,479,991		0.0000	1.0000	100.00
0.5	22,614,917		0.0000	1.0000	100.00
1.5	22,502,129	48	0.0000	1.0000	100.00
2.5	21,378,960	1	0.0000	1.0000	100.00
3.5	21,793,356	7,688	0.0004	0.9996	100.00
4.5	21,428,139	54,595	0.0025	0.9975	99.96
5.5	20,858,600		0.0000	1.0000	99.71
6.5	21,841,774	222,065	0.0102	0.9898	99.71
7.5	21,561,809	24,455	0.0011	0.9989	98.70
8.5	21,018,686	2,420	0.0001	0.9999	98.58
9.5	15,050,638		0.0000	1.0000	98.57
10.5	10,354,969		0.0000	1.0000	98.57
11.5	10,781,307		0.0000	1.0000	98.57
12.5	8,669,950	19,239	0.0022	0.9978	98.57
13.5	6,825,488		0.0000	1.0000	98.35
14.5	5,975,354		0.0000	1.0000	98.35
15.5	5,870,419		0.0000	1.0000	98.35
16.5	15,334,791	65,289	0.0043	0.9957	98.35
17.5	15,247,936	149,273	0.0098	0.9902	97.94
18.5	15,493,166		0.0000	1.0000	96.98
19.5	15,666,344		0.0000	1.0000	96.98
20.5	15,832,535		0.0000	1.0000	96.98
21.5	15,968,894		0.0000	1.0000	96.98
22.5	15,829,426		0.0000	1.0000	96.98
23.5	15,570,016		0.0000	1.0000	96.98
24.5	15,114,528	2,140	0.0001	0.9999	96.98
25.5	15,066,807		0.0000	1.0000	96.96
26.5	12,950,678		0.0000	1.0000	96.96
27.5	12,841,835		0.0000	1.0000	96.96
28.5	12,552,524		0.0000	1.0000	96.96
29.5	11,586,678		0.0000	1.0000	96.96
30.5	11,465,662	44,465	0.0039	0.9961	96.96
31.5	10,704,030		0.0000	1.0000	96.59
32.5	10,702,764		0.0000	1.0000	96.59
33.5	11,087,720	182	0.0000	1.0000	96.59
34.5	12,096,433		0.0000	1.0000	96.59
35.5	32,185,129		0.0000	1.0000	96.59
36.5	22,647,665		0.0000	1.0000	96.59
37.5	22,642,493	0	0.0000	1.0000	96.59
38.5	22,285,879		0.0000	1.0000	96.59

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ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1913-2018 EXPERIENCE BAND 1999-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	22,243,946		0.0000	1.0000	96.59
40.5	22,036,930		0.0000	1.0000	96.59
41.5	21,867,235		0.0000	1.0000	96.59
42.5	21,864,549		0.0000	1.0000	96.59
43.5	21,873,191	1,293	0.0001	0.9999	96.59
44.5	21,855,767		0.0000	1.0000	96.58
45.5	21,874,560		0.0000	1.0000	96.58
46.5	21,889,259		0.0000	1.0000	96.58
47.5	22,060,538		0.0000	1.0000	96.58
48.5	21,773,943		0.0000	1.0000	96.58
49.5	21,224,091		0.0000	1.0000	96.58
50.5	7,356,064		0.0000	1.0000	96.58
51.5	7,136,243		0.0000	1.0000	96.58
52.5	7,141,617	2,749	0.0004	0.9996	96.58
53.5	7,125,486		0.0000	1.0000	96.54
54.5	6,727,694		0.0000	1.0000	96.54
55.5	626,313		0.0000	1.0000	96.54
56.5	609,402	24,203	0.0397	0.9603	96.54
57.5	607,126		0.0000	1.0000	92.71
58.5	747,134		0.0000	1.0000	92.71
59.5	729,069		0.0000	1.0000	92.71
60.5	740,513	2,856	0.0039	0.9961	92.71
61.5	720,899		0.0000	1.0000	92.35
62.5	753,593	1,572	0.0021	0.9979	92.35
63.5	742,793	1,299	0.0017	0.9983	92.16
64.5	727,813	11,808	0.0162	0.9838	92.00
65.5	701,980	44,417	0.0633	0.9367	90.50
66.5	631,621		0.0000	1.0000	84.78
67.5	2,135,009		0.0000	1.0000	84.78
68.5	14,081,264		0.0000	1.0000	84.78
69.5	14,327,383		0.0000	1.0000	84.78
70.5	14,338,703		0.0000	1.0000	84.78
71.5	14,389,661	251	0.0000	1.0000	84.78
72.5	14,421,909	352	0.0000	1.0000	84.78
73.5	14,441,650	2,958	0.0002	0.9998	84.77
74.5	14,446,199		0.0000	1.0000	84.76
75.5	14,468,865		0.0000	1.0000	84.76
76.5	14,488,044		0.0000	1.0000	84.76
77.5	14,492,853		0.0000	1.0000	84.76
78.5	14,360,885	751	0.0001	0.9999	84.76

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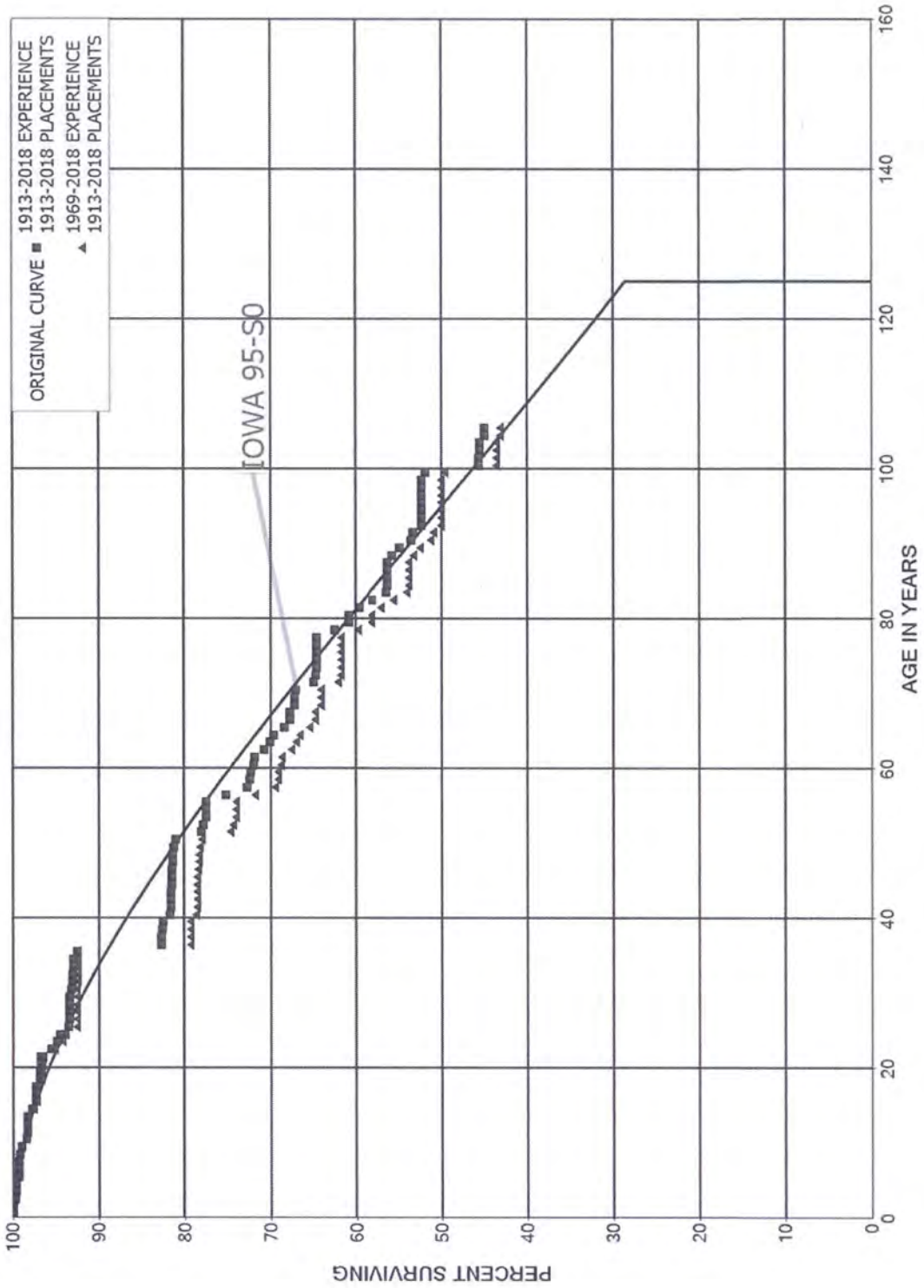
ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1913-2018 EXPERIENCE BAND 1999-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
79.5	14,355,740		0.0000	1.0000	84.75
80.5	14,354,340	1	0.0000	1.0000	84.75
81.5	14,405,527	25,488	0.0018	0.9982	84.75
82.5	14,362,268	17,196	0.0012	0.9988	84.60
83.5	14,342,882	814	0.0001	0.9999	84.50
84.5	14,521,912	17,772	0.0012	0.9988	84.50
85.5	18,750,655	59,167	0.0032	0.9968	84.39
86.5	18,689,566		0.0000	1.0000	84.13
87.5	16,882,281	9,632	0.0006	0.9994	84.13
88.5	4,897,455		0.0000	1.0000	84.08
89.5	4,606,648		0.0000	1.0000	84.08
90.5	4,602,151	11,482	0.0025	0.9975	84.08
91.5	4,515,336		0.0000	1.0000	83.87
92.5	4,479,835	530	0.0001	0.9999	83.87
93.5	4,449,580	11,482	0.0026	0.9974	83.86
94.5	4,430,472	1,131	0.0003	0.9997	83.64
95.5	4,406,448	6,477	0.0015	0.9985	83.62
96.5	4,386,000	22,964	0.0052	0.9948	83.50
97.5	4,363,036		0.0000	1.0000	83.06
98.5	4,369,145	6,495	0.0015	0.9985	83.06
99.5	4,362,650	151,185	0.0347	0.9653	82.94
100.5	4,206,551		0.0000	1.0000	80.06
101.5	4,202,077	73,379	0.0175	0.9825	80.06
102.5	4,114,209	1,096	0.0003	0.9997	78.67
103.5	4,113,113		0.0000	1.0000	78.64
104.5	4,018,842		0.0000	1.0000	78.64
105.5					78.64

AMEREN MISSOURI
ACCOUNT 333 WATER WHEELS, TURBINES AND GENERATORS
ORIGINAL AND SMOOTH SURVIVOR CURVES



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ACCOUNT 333 WATER WHEELS, TURBINES AND GENERATORS

ORIGINAL LIFE TABLE

PLACEMENT BAND 1913-2018 EXPERIENCE BAND 1913-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
0.0	281,776,337	82	0.0000	1.0000	100.00
0.5	279,667,429	125	0.0000	1.0000	100.00
1.5	277,036,091	830,815	0.0030	0.9970	100.00
2.5	257,547,182	101,357	0.0004	0.9996	99.70
3.5	243,963,221	37,194	0.0002	0.9998	99.66
4.5	244,851,293	772,113	0.0032	0.9968	99.65
5.5	242,678,508	5,093	0.0000	1.0000	99.33
6.5	200,231,091	9,812	0.0000	1.0000	99.33
7.5	198,766,766	196,175	0.0010	0.9990	99.32
8.5	174,476,127	457,082	0.0026	0.9974	99.23
9.5	136,755,257	779,756	0.0057	0.9943	98.97
10.5	120,852,890	139,923	0.0012	0.9988	98.40
11.5	118,451,892		0.0000	1.0000	98.29
12.5	118,056,670	183	0.0000	1.0000	98.29
13.5	111,994,144	698,812	0.0062	0.9938	98.29
14.5	110,589,716	384,951	0.0035	0.9965	97.67
15.5	103,745,923	7,659	0.0001	0.9999	97.33
16.5	76,001,949	39,163	0.0005	0.9995	97.33
17.5	66,996,863	273,953	0.0041	0.9959	97.28
18.5	66,434,426	36,642	0.0006	0.9994	96.88
19.5	46,527,912	27,791	0.0006	0.9994	96.83
20.5	46,471,874	36,255	0.0008	0.9992	96.77
21.5	45,681,956	543,727	0.0119	0.9881	96.69
22.5	45,126,138	318,748	0.0071	0.9929	95.54
23.5	43,350,519	151,805	0.0035	0.9965	94.87
24.5	38,904,507	427,312	0.0110	0.9890	94.53
25.5	33,463,792	26,087	0.0008	0.9992	93.50
26.5	30,538,635	4,442	0.0001	0.9999	93.42
27.5	30,276,984		0.0000	1.0000	93.41
28.5	30,252,437		0.0000	1.0000	93.41
29.5	30,265,720	77,220	0.0026	0.9974	93.41
30.5	30,188,500	29,504	0.0010	0.9990	93.17
31.5	30,187,030	108	0.0000	1.0000	93.08
32.5	30,199,353	54,811	0.0018	0.9982	93.08
33.5	30,093,875	763	0.0000	1.0000	92.91
34.5	29,845,646	119,612	0.0040	0.9960	92.91
35.5	29,708,084	3,134,123	0.1055	0.8945	92.54
36.5	26,577,683	6,032	0.0002	0.9998	82.77
37.5	26,585,814	56,161	0.0021	0.9979	82.76
38.5	26,515,715	21,530	0.0008	0.9992	82.58

AMEREN MISSOURI

ACCOUNT 333 WATER WHEELS, TURBINES AND GENERATORS

ORIGINAL LIFE TABLE, CONT.

PLACEMENT BAND 1913-2018 EXPERIENCE BAND 1913-2018

AGE AT BEGIN OF INTERVAL	EXPOSURES AT BEGINNING OF AGE INTERVAL	RETIREMENTS DURING AGE INTERVAL	RETMT RATIO	SURV RATIO	PCT SURV BEGIN OF INTERVAL
39.5	26,511,328	249,267	0.0094	0.9906	82.51
40.5	26,270,846	43,688	0.0017	0.9983	81.74
41.5	26,227,158	2,938	0.0001	0.9999	81.60
42.5	26,220,359	1,951	0.0001	0.9999	81.59
43.5	26,233,330	11,468	0.0004	0.9996	81.59
44.5	26,218,170	1,426	0.0001	0.9999	81.55
45.5	26,214,649	18,529	0.0007	0.9993	81.55
46.5	26,202,928	45,693	0.0017	0.9983	81.49
47.5	25,164,960	682	0.0000	1.0000	81.35
48.5	25,226,480	3,332	0.0001	0.9999	81.34
49.5	24,633,037	66,086	0.0027	0.9973	81.33
50.5	24,469,625	934,098	0.0382	0.9618	81.12
51.5	23,531,994	68,079	0.0029	0.9971	78.02
52.5	23,463,915	100,764	0.0043	0.9957	77.79
53.5	23,341,895		0.0000	1.0000	77.46
54.5	23,239,722		0.0000	1.0000	77.46
55.5	11,722,493	350,280	0.0299	0.9701	77.46
56.5	11,370,212	372,755	0.0328	0.9672	75.14
57.5	11,003,733	49,212	0.0045	0.9955	72.68
58.5	10,941,066	12,081	0.0011	0.9989	72.36
59.5	10,953,801	43,728	0.0040	0.9960	72.28
60.5	10,883,689	23,467	0.0022	0.9978	71.99
61.5	10,848,705	170,340	0.0157	0.9843	71.83
62.5	10,678,365	98,005	0.0092	0.9908	70.70
63.5	10,576,955	69,133	0.0065	0.9935	70.06
64.5	10,465,462	174,918	0.0167	0.9833	69.60
65.5	9,427,409	96,991	0.0103	0.9897	68.43
66.5	8,184,796		0.0000	1.0000	67.73
67.5	8,004,000	71,984	0.0090	0.9910	67.73
68.5	7,931,897		0.0000	1.0000	67.12
69.5	7,931,671	6,190	0.0008	0.9992	67.12
70.5	7,760,992	249,283	0.0321	0.9679	67.07
71.5	7,309,482	26,721	0.0037	0.9963	64.91
72.5	7,280,687	1,995	0.0003	0.9997	64.68
73.5	7,288,324		0.0000	1.0000	64.66
74.5	7,283,275		0.0000	1.0000	64.66
75.5	7,165,816		0.0000	1.0000	64.66
76.5	7,081,046	6,190	0.0009	0.9991	64.66
77.5	7,073,514	224,925	0.0318	0.9682	64.60
78.5	6,846,903	191,787	0.0280	0.9720	62.55