Exhibit No.:	
Issue(s):	*Depreciation*
Witness:	*Cedric E. Cunigan, PE*
Sponsoring Party:	*MoPSC Staff*
Type of Exhibit:	*Direct Testimony*
Case No.:	*ER-2022-0337*
Date Testimony Prepared:	*January 10, 2023*

MISSOURI PUBLIC SERVICE COMMISSION

INDUSTRY ANALYSIS DIVISION

ENGINEERING ANALYSIS DEPARTMENT

DIRECT TESTIMONY

OF

CEDRIC E. CUNIGAN, PE

UNION ELECTRIC COMPANY,
d/b/a Ameren Missouri

CASE NO. ER-2022-0337

Jefferson City, Missouri
January 2023

DIRECT TESTIMONY

OF

CEDRIC E. CUNIGAN, PE

UNION ELECTRIC COMPANY,
d/b/a Ameren Missouri

CASE NO. ER-2022-0337

Q. Please state your name and business address.

A. My name is Cedric E. Cunigan. My business address is 200 Madison Street, Jefferson City, Missouri 65101.

Q. By whom are you employed and in what capacity?

A. I am employed by the Missouri Public Service Commission ("Commission") as a Senior Professional Engineer in the Engineering Analysis Department, Industry Analysis Division.

Q. Please describe your educational background and work experience.

A. Please refer to Schedule CEC-d1 attached to this Direct testimony for my credentials and a list of cases which I have filed testimony or recommendations.

EXECUTIVE SUMMARY

Q. What is the purpose of your direct testimony?

A. I will be providing Staff's depreciation analysis and rates for Ameren's plant in service. I will also discuss Staff's concern with Ameren Missouri's continuing plant inventory records, also referred to as a continuing property record ("CPR").

Q. Do you provide input or work product to another Staff witness for the development of an issue?

A. Yes. I provided my recommended depreciation rates to Staff witnesses Matthew R. Young and Jared Giacone to use in the development of Staff's EMS run.

Q. Through this testimony, do you provide any recommendations that should be specifically reflected in the Commission's Report and Order in this case?

A. Yes. In this testimony I recommend that the Commission order the depreciation rates that Staff has prepared and recommended. Staff's depreciation rates have been included as Schedule CEC-d2.

DEPRECIATION

Q. Please explain what depreciation is generally.

A. Depreciation is the loss in value an asset experiences over time. The loss in value can be attributed to many things such as wear and tear, functional obsolescence, and environmental factors. One example that we see in everyday life is cars. A used car is less valuable than a new car of the same year and model typically due to assumed wear and tear. Two used cars of the same make and model will vary in price based on their mileage as well. And finally, two new cars of the same model, but different years will typically vary in price with the newer model year being more expensive due to obsolescence.

Staff accounts for depreciation by reducing the book value of the assets over the estimated useful life of the asset. The rate of reduction is the depreciation rate. The depreciation rate is determined by looking at historical data on asset lives, retirement costs, and salvage costs. The application of depreciation rates results in a depreciation expense that is the depreciation rate times the book value of the assets. This depreciation expense accumulates in a depreciation reserve, which offsets the original investment level for purposes of calculating rates.

Q. How is this applied to a regulated utility?

A. For a regulated utility, depreciation expense is the return of investment to investors over time. A depreciation rate is calculated that, when applied to the level of depreciable plant investment, approximates on an annual basis "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 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 requirements of public authorities."[1] In Missouri, the depreciation rate will also generally reflect an allowance for the net salvage value expected upon retirement of items in the plant account.

Q. How is depreciation calculated?

A. A depreciation study is performed in which the survival rates of assets, salvage rates, and associated costs of assets are tracked over time.

Q. Did Staff perform its own depreciation study?

A. Yes.

Q. How did Staff obtain data for the study?

A. A depreciation study was provided in this case in the testimony of Ameren witness John J. Spanos. Staff also requested additional information in data requests.

Q. By what method, procedure, and technique did Staff use to calculate the depreciation rates?

[1] 18 CFR Part 101 Uniform System of Accounts (USOA) Prescribed for Public Utilities and Licensees Subject to Provision of the Federal Power Act Definition 12.

A. Depending on the account, Staff used different procedures to calculate the depreciation rates. Staff separated the accounts into three groups: production plant with probable retirement dates, general plant accounts utilizing general plant amortization, and all other plant accounts.

Q. What method, procedure, and technique did Staff use to calculate the depreciation rates for the production plant accounts with probable retirement dates?

A. For production plant accounts with probable retirement dates, Staff utilized the straight-line method, broad group-averaging life procedure, and remaining life technique.

Q. What is the straight-line method?

A. The straight-line method allocates expense evenly over the expected life of the assets in the individual accounts. The straight-line method is the most common method used for asset depreciation. Another method of depreciation could be the declining method, which would front load the depreciation expense at the early years of an assets life. This method does not work well for mass asset accounting.

Q. What is the broad group-averaging life procedure?

A. The broad group-averaging life procedure bases annual depreciation on the average service life of the account rather than looking at each individual installation year and analyzing them separately.

Q. What is the remaining life technique?

A. The remaining life technique uses the surviving plant less book depreciation reserve as the depreciable cost and uses the average remaining service life of the assets. The other technique that could be used is the whole life technique where the depreciation cost is

only the original cost spread out evenly over the average service life of the assets. I discuss Staff's use of this technique later in my testimony.

Q. Why did Staff use the straight-line method, broad group-averaging life procedure, and the remaining life technique for the production plant accounts with probable retirement years?

A. Staff chose this method, procedure, and technique because these assets have a retirement date listed in the study and included Ameren's Integrated Resource Plan ("IRP"). Staff calculated its proposed depreciation rates so that the accounts would be fully accrued by the plant retirement dates. This method minimizes generational cost subsidies associated with specific generation facilities. It is only applicable when there is a reasonable estimate of a termination date.

Q. Which plant accounts did staff apply general plant amortization to calculate the depreciation rates?

A. Staff utilized general plant amortization on Accounts 390.05 Structures and Improvements – Training Assets, 391.00 Office Furniture and Equipment – Furniture, 391.20 Office – Personal Computers, 391.30 Office Furniture and Equipment – Equipment, 392.05 Transportation Equipment – Training Assets, 393.00 Stores Equipment, 394.00 Tools Shop and Garage Equipment, 394.05 Tools, Shop, and Garage Equipment – Training Assets, 395.00 Laboratory Equipment, 397.00 Communication Equipment, 397.05 Communication Equipment – Training Assets, and 398.00 Miscellaneous Equipment.

Q. What is general plant amortization?

A. General plant amortization expenses the full account value over a set amount of time. This means that all assets in a vintage year are retired together once they reach the age of the amortization period, as opposed to retiring individual assets.

Q. Has use of general plant amortization been previously ordered by the Commission?

A. Yes. General plant amortization was previously ordered for these accounts in Ameren's last rate case, Case No. ER-2021-0240.

Q. Why did Staff decide to utilize general plant amortization for these accounts?

A. These accounts have a high volume of low value assets that experience a predictable retirement. The accounts where amortization is used would typically have high inventory and tracking costs relative to the value of the individual assets. The accounts are also given a salvage rate of zero percent and they are retired from use when the asset reaches the accounts average service life.

Q. What did Staff do to calculate the depreciation rates for the remaining accounts?

A. Staff utilized the straight-line method, broad group-averaging life procedure, and the whole life technique. Staff utilized this method for all other accounts not previously mentioned.

Q. You have already previously discussed the straight-line method and broad group-averaging life procedure, but what is the whole life technique?

A. The whole life technique applies the depreciation rate over the life of the assets. This procedure uses the average service life of the assets to calculate annual accrual rather than the average remaining life.

Q. Why did Staff use this method, procedure, and technique to calculate the depreciation rate for the remaining accounts?

A. Unlike the accounts using the remaining life technique, these accounts do not have a final retirement date of the accounts. By using the whole life technique for these accounts, the accounts will accrue depreciation reserve equal to its original cost and net salvage divided equally over its average life. This technique does not take into account the current status of the accounts depreciation reserve as the remaining life technique does. Using the remaining life technique can lead to lower or higher depreciation rates as compared to those calculated using the whole life technique since it brings in the depreciation reserve and only spreads the depreciation cost over the average remaining life of the assets currently in the account. This could cause any new assets to have a depreciation rate applied to them that may lead to an over-accrual or under-accrual.

Q. What is average service life, and how does Staff calculate it?

A. Average service life is the age at which half of the asset group would be expected to be retired. You would expect some individual assets to retire before the mean point and some to retire after the mean point, but the mean provides a way to estimate the group as a whole. Average service life can be determined by plotting the percentage of assets surviving against the age of the assets in a survivor curve, and calculating the area under that curve. For an account in which all plant is retired, the full survivor curve is available and average service life can be calculated. Accounts with plant remaining have a partial curve, which is known as a stub curve. The average service life can be estimated by comparing a stub curve to Iowa curves[2]

[2] A standard curve system used to estimate survival rates of assets in a variety of industries including public utilities.

and fitting the best matched curve. Iowa curves represent common survival rates and patterns of assets, and are widely used to estimate depreciation. Staff receives data in excel or notepad format for retirements and salvage information. The data includes installment year (vintage), Federal Energy Regulatory Commission (FERC) account, type of transaction, transaction year, amount of the transaction, and group or location codes. Staff uses a version of Gannett Fleming Software to complete the following actions with the Company provided data. First, the data is sorted and checked for errors. Next, the software allows Staff to analyze the amount of plant that has been retired at each age and plot the stub curve. Then, Staff matches an appropriate Iowa curve to the stub curve data. Curves are fitted using a mixture of mathematical and visual fitting practices. Once a curve is chosen, Staff has an estimate of the average service life.

Q. Is the average service life the only estimation used?

A. No. Most generation facilities will have an expected retirement date when the entire plant will be closed. For these facilities a remaining life estimate can be used to calculate the rate instead of the average service life. Average service life is used for assets that do not have a known or estimated retirement date, such as transmission, distribution, or general plant accounts.

Q. How is depreciation expense calculated?

A. Annual Depreciation expense can be calculated using the following equations:

$$depreciation\ expense = \frac{Cost - net\ salvage\ value - accumulated\ depreciation}{life\ estimate}$$

$$depreciation\ rate\ = \frac{1 - net\ salvage\ percent - percent\ accumulated\ depreciation}{life\ estimate}$$

The life estimate in the above equations could be either the remaining life or the average service life.

Q. What is net salvage and how is it determined?

A. Net salvage is the amount required to retire an asset or the amount to be recouped at the retirement of an asset. Some items will have dismantling costs, but there may also be recovery of funds through resale or recycling. Net salvage can be calculated using the following equation:

$$net\ salvage = gross\ salvage - cost\ of\ removal$$

Gross salvage is the removed market value of the retired asset. Cost of removal is the cost associated with the retirement and disposition of the asset from service. Staff determined net salvage percentages by dividing the experienced net cost of removal by the original cost of plant retired during the same time period to calculate the net salvage percentage. Staff analyzes net salvage percentage using a 3-year or 5-year moving average to determine trends. Staff then used the life and net salvage estimates to calculate a depreciation rate for each account.

For the production plant accounts, Staff calculated its net salvage percentage based on the interim net salvage of those accounts. Staff did not include an additional adjustment for terminal net salvage.

Q. What is interim net salvage and terminal net salvage?

A. Interim net salvage is associated with the retirements the accounts would see during the life of the account. Terminal net salvage is associated with the final retirement of the account or plant and its associated costs. For example, you might expect to replace or repair individual components of a unit such as turbine blades or boiler tubes as a part of routine operations and maintenance. These costs would be considered interim salvage. Other costs associated with the final termination of the facility, such as closure of landfills, demolition of facilities, and end use costs would be considered terminal salvage.

Q. Why did Staff only consider the interim net salvage in its calculations?

A. The Commission has not recently granted terminal salvage. The Commission's Report and Order filed in Case No. ER-2007-0002 issued May 22, 2007 states in its decision "The Commission accepts the net salvage percentages advocated by Staff. Terminal net salvage relating to Steam and Hydraulic Plant depreciation shall not be recovered from ratepayers at this time." Ameren has not requested it, nor provided estimates for terminal salvage in this case.

Q. What depreciation rates does Staff recommend the Commission order for use by Ameren?

A. Staff recommends the Commission order Ameren to use the depreciation rates attached to this testimony in Schedule CEC-d2.

CONTINUING PLANT INVENTORY RECORD

Q. Earlier you mentioned Staff has concerns with Ameren Missouri's CPR. What is the CPR?

A. The CPR is a record of plant assets that electric utilities are required to maintain[3]. The assets are segregated by individual retirement units, or in some instances, groups of assets can be accounted for in mass property accounts. The FERC USOA requires the following information for the CPR:

(1) The name or description of the unit, or both;
(2) The location of the unit;
(3) The date the unit was placed in service;
(4) The cost of the unit as set forth in Plant Instructions 2 and 3 of this part; and,
(5) The plant control account to which the cost of the unit is charged.

[3] 20 CSR 4240-20.030 (3)(A) Maintain plant records of the year of each unit's retirement as part of the "continuing plant inventory records," as the term is otherwise defined at Part 101 Definitions 8. and paragraph 15,001.8.

For each category of mass property the following information is required:

(1) A general description of the property and quantity;
(2) The quantity placed in service by vintage year;
(3) The average cost as set forth in Plant Instructions 2 and 3 of this part; and,
(4) The plant control account to which the costs are charged.[4]

Q. Please explain Staff's concern with Ameren Missouri's CPR.

A. Ameren Missouri's November 15, 2022 supplemental response to Staff data request 209.1 indicates that Ameren Missouri is not keeping all of the required records for their mass property accounts. Ameren stated, "Vintage, location, voltage, etc. are not a part of the asset information collected (which is by design because not collecting such information is the essence of and a key benefit of using mass property accounting)." Ameren also stated, "The information sent to PowerPlan includes the retirement unit (40' pole) and the quantities retired (2). PowerPlan then automatically uses the Iowa survivor curve for the account where the cost of 40' poles are recorded to determine what quantities within any given vintage year it will select for retirement. **That vintage year will not, except by pure coincidence, match the vintage of the actual asset retired in the field.**" [Emphasis added.]

Vintage year is specifically required to be recorded in the CPR and depreciation database by 20 CSR 4240-20.030 (3)(A). It appears from this response that Ameren is not recording its actual vintage years when retiring assets, but is letting its depreciation software determine the vintage years to retire. This is an issue because the CPR is no longer accurate, except by pure coincidence. In addition, the records of asset lives are used to determine the very survival curves that Ameren is using to select vintage years to retire. That in itself is a

[4] Uniform System of Accounts Prescribed for Public Utilities and Licensees Subject to the Provisions of the Federal Power Act Definitions, Definition 8. Continuing Plant Inventory Record.

circular argument that will only continue to reinforce the current survival curve choice rather than reflect the actual plant in service. Staff is requesting additional information on this topic and will update this issue in rebuttal. At this time, Staff recommends the Commission order Ameren to stop its practice of allowing PowerPlan to choose which assets to retire from the CPR and depreciation database, and record vintage year and average cost information for their retirements as required by 20 CSR 4240-20.030 (3)(A).

Q. Does this conclude your direct testimony?

A. Yes it does.

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

In the Matter of Union Electric Company d/b/a Ameren Missouri's Tariffs to Adjust Its Revenues for Electric Service	)))	Case No. ER-2022-0337

AFFIDAVIT OF CEDRIC E. CUNIGAN, PE

STATE OF MISSOURI	)	
	)	ss.
COUNTY OF COLE	)	

COMES NOW CEDRIC E. CUNIGAN, PE and on his oath declares that he is of sound mind and lawful age; that he contributed to the foregoing *Direct Testimony of Cedric E. Cunigan, PE*; and that the same is true and correct according to his best knowledge and belief.

Further the Affiant sayeth not.

CEDRIC E. CUNIGAN, PE

JURAT

Subscribed and sworn before me, a duly constituted and authorized Notary Public, in and for the County of Cole, State of Missouri, at my office in Jefferson City, on this 4th day of January 2023.

Notary Public

D. SUZIE MANKIN
Notary Public - Notary Seal
State of Missouri
Commissioned for Cole County
My Commission Expires: April 04, 2025
Commission Number: 12412070

Cedric E. Cunigan, PE

PRESENT POSITION:

I am a Professional Engineer in the Engineering Analysis Department, Industry Analysis Division, of the Missouri Public Service Commission.

EDUCATIONAL BACKGROUND AND WORK EXPERIENCE:

In May 2011, I earned a Bachelor of Science in Biological Engineering from the University of Missouri, in Columbia. In May 2013, I earned a Master of Business Administration, also from the University of Missouri. I began work with the Missouri Department of Natural Resources Solid Waste Management Program in August 2013. I started as a Technician and was promoted to an Environmental Engineer I in January 2014. I transferred to the Hazardous Waste Program in September 2014. In January 2015, I was promoted to an Environmental Engineer II. I ended employment with the Department of Natural Resources in January of 2017 and began work with the Missouri Public Service Commission as a Utility Engineering Specialist III. I received my professional engineer's license in October 2021.

Summary of Case Involvement:

Case Number	Utility	Type	Issue
EO-2017-0267	Empire District Electric Company	Memorandum	RES Compliance Report and Plan
EO-2017-0270	KCP&L Greater Missouri Operations Company	Memorandum	RES Compliance Report
EO-2017-0272	KCP&L Greater Missouri Operations Company	Memorandum	RES Compliance Plan
EO-2018-0111	Macon Electric Cooperative & City of Marceline	Memorandum	Change of Supplier
EC-2018-0089	Union Electric Company d/b/a Ameren Missouri	Staff Report	Complaint Investigation
EO-2018-0285	Empire District Electric Company	Memorandum	RES Compliance Report and Plan
EO-2018-0289	KCP&L Greater Missouri Operations Company	Memorandum	RES Compliance Report

Case Number	Utility	Type	Issue
EO-2018-0291	KCP&L Greater Missouri Operations Company	Memorandum	RES Compliance Plan
ER-2018-0145 & ER-2018-0146	KCPL & KCP&L Greater Missouri Operations Company	Cost of Service Report, Rebuttal, & Surrebuttal	Renewable Energy
WR-2018-0328	Middlefork Water Company	Depreciation Workpapers	Depreciation
EA-2018-0202	Union Electric Company d/b/a Ameren Missouri	Staff Report	Certificate of Convenience and Necessity Application Requirements
EC-2018-0376	Union Electric Company d/b/a Ameren Missouri	Staff Report	Complaint Investigation
EA-2019-0010 & EA-2019-0118	Union Electric Company d/b/a Ameren Missouri	Staff Report	Certificate of Convenience and Necessity Application Requirements
EA-2019-0021	Union Electric Company d/b/a Ameren Missouri	Staff Report	Certificate of Convenience and Necessity Application Requirements
EE-2019-0305	Empire District Electric Company	Memorandum	RES Compliance Report and Plan
EO-2019-0320	Union Electric Company d/b/a Ameren Missouri	Memorandum	RES Compliance Report and Plan
EO-2019-0371	Union Electric Company d/b/a Ameren Missouri	Staff Report	Certificate of Convenience and Necessity Application Requirements
EE-2020-0411	Union Electric Company d/b/a Ameren Missouri	Memorandum	RES Compliance Plan
ET-2020-0259	Empire District Electric Company	Memorandum	Renewable Energy Tariff
EO-2020-0323	Empire District Electric Company	Memorandum	RES Compliance Report and Plan
EO-2020-0328	Union Electric Company d/b/a Ameren Missouri	Memorandum	RES Compliance Report and Plan
EA-2020-0371	Union Electric Company d/b/a Ameren Missouri	Staff Report	Certificate of Convenience and Necessity Application Requirements
WR-2020-0344	Missouri American Water Company	Cost of Service Report, Rebuttal, and Surrebuttal	Depreciation

Case Number	Utility	Type	Issue
SA-2021-0017	Missouri American Water Company	Staff Report	Depreciation
EO-2021-0032	Evergy	Staff Report	Solar Requirements 393.1665 RSMo
SA-2021-0120	Missouri American Water Company	Staff Report	Depreciation
EO-2021-0344	Empire District Electric Company	Memorandum	RES Compliance Report and Plan
EO-2021-0352	Union Electric Company d/b/a Ameren Missouri	Memorandum	RES Compliance Report and Plan
ER-2021-0240	Union Electric Company d/b/a Ameren Missouri	Cost of Service Report, Rebuttal, and Surrebuttal	Depreciation
ER-2021-0312	Empire District Electric Company	Cost of Service Report, Direct, Rebuttal, and Surrebuttal	Depreciation
SR-2021-0372	Mid MO Sanitation, LLC	Disposition Agreement	Depreciation
WA-2021-0391	Missouri American Water Company	Staff Report	Depreciation
ER-2022-0129	Evergy Missouri Metro	Direct, Rebuttal, Surrebuttal	Renewable Energy Tariff
ER-2022-0130	Evergy Missouri West	Direct, Rebuttal, Surrebuttal	Depreciation, Renewable Energy Tariff
EA-2022-0245	Union Electric Company d/b/a Ameren Missouri	Rebuttal	Certificate of Convenience and Necessity Application Requirements
EO-2022-0282	Empire District Electric Company	Memorandum	RES Compliance Report and Plan
EO-2022-0283	Union Electric Company d/b/a Ameren Missouri	Memorandum	RES Compliance Report and Plan
WA-2022-0311	Missouri American Water Company	Memorandum	Depreciation

AMEREN MISSOURI
ELECTRIC DIVISION
SUMMARY OF ESTIMATED SURVIVOR CURVES, NET SALVAGE PERCENT, AND ANNUAL DEPRECIATION RATES

	DEPRECIABLE GROUP	PROB. RET. DATE	SURVIVOR CURVE	NET SALVAGE PERCENT	DEPRECIATION RATE
	STEAM PRODUCTION PLANT				
311	STRUCTURES AND IMPROVEMENTS				
	MERAMEC	Dec-22	95-R1.5	0	10.90
	SIOUX	Dec-30	95-R1.5	-1	5.89
	LABADIE	Dec-42	95-R1.5	-1	3.33
	COMMON - ALL STEAM PLANTS	May-25	95-R1.5	0	15.07
	RUSH ISLAND	Dec-39	95-R1.5	-1	3.56
312	BOILER PLANT EQUIPMENT				
	MERAMEC	Dec-22	60-R0.5	0	10.37
	SIOUX	Dec-30	60-R0.5	-2	7.00
	LABADIE	Dec-42	60-R0.5	-5	3.90
	COMMON - ALL STEAM PLANTS	May-25	60-R0.5	-2	13.13
	RUSH ISLAND	Dec-39	60-R0.5	-4	4.12
312.03	BOILER PLANT EQUIPMENT - ALUMINUM COAL CARS		35-R2	25	0.14
314	BOILER PLANT EQUIPMENT				
	MERAMEC	Dec-22	60-S0.5	0	5.92
	SIOUX	Dec-30	60-S0.5	-1	6.27
	LABADIE	Dec-42	60-S0.5	-2	4.32
	RUSH ISLAND	Dec-39	60-S0.5	-2	3.46
315	ACCESSORY ELECTRIC EQUIPMENT				
	MERAMEC	Dec-22	75-S0	0	13.75
	SIOUX	Dec-30	75-S0	-1	7.09
	LABADIE	Dec-42	75-S0	-2	3.08
	COMMON - ALL STEAM PLANTS	May-25	75-S0	-1	14.91
	RUSH ISLAND	Dec-39	75-S0	-2	3.58
316	MISCELLANEOUS POWER PLANT EQUIPMENT				
	MERAMEC	Dec-22	40-L0	0	27.91
	SIOUX	Dec-30	40-L0	0	8.50
	LABADIE	Dec-42	40-L0	-1	4.12
	COMMON - ALL STEAM PLANTS	May-25	40-L0	0	16.07
	RUSH ISLAND	Dec-39	40-L0	-1	5.61
316.21	MISCELLANEOUS POWER PLANT EQUIPMENT - FURNITURE				
	MERAMEC		20-SQ	0	5.00
	SIOUX		20-SQ	0	5.00
	LABADIE		20-SQ	0	5.00
	RUSH ISLAND		20-SQ	0	5.00
316.22	MISCELLANEOUS POWER PLANT EQUIPMENT - OFFICE				
	MERAMEC		15-SQ	0	6.67
	SIOUX		15-SQ	0	6.67
	LABADIE		15-SQ	0	6.67
	RUSH ISLAND		15-SQ	0	6.67
316.23	MISCELLANEOUS POWER PLANT EQUIPMENT - COMPUTERS				
	MERAMEC		5-SQ	0	20.00
	SIOUX		5-SQ	0	20.00
	LABADIE		5-SQ	0	20.00
	RUSH ISLAND		5-SQ	0	20.00

AMEREN MISSOURI
ELECTRIC DIVISION
SUMMARY OF ESTIMATED SURVIVOR CURVES, NET SALVAGE PERCENT, AND ANNUAL DEPRECIATION RATES

	DEPRECIABLE GROUP	PROB. RET. DATE	SURVIVOR CURVE	NET SALVAGE PERCENT	DEPRECIATION RATE
	NUCLEAR PRODUCTION PLANT				
321	STRUCTURES AND IMPROVEMENTS	Oct-44	90-R2	-1	1.63
322	REACTOR PLANT EQUIPMENT	Oct-44	55-S0.5	-3	2.83
323	TURBOGENERATOR UNITS	Oct-44	50-S0.5	-4	2.99
324	ACCESSORY ELECTRIC EQUIPMENT	Oct-44	75-R2	-1	2.30
325	MISCELLANEOUS POWER PLANT EQUIPMENT	Oct-44	40-L0	0	3.97
325.21	MISCELLANEOUS POWER PLANT EQUIPMENT - FURNITURE		20-SQ	0	5.00
325.22	MISCELLANEOUS POWER PLANT EQUIPMENT - OFFICE		15-SQ	0	6.67
325.23	MISCELLANEOUS POWER PLANT EQUIPMENT - COMPUTERS		5-SQ	0	20.00
	HYDRAULIC PRODUCTION PLANT				
331	STRUCTURES AND IMPROVEMENTS				
	OSAGE	Jun-47	125-R1	-2	3.49
	TAUM SAUK	Jun-89	125-R1	-5	1.38
	KEOKUK	Jun-55	125-R1	-2	2.71
332	RESERVOIRS, DAMS AND WATERWAYS				
	OSAGE	Jun-47	150-R2.5	-1	3.92
	TAUM SAUK	Jun-89	150-R2.5	-3	19.47
	KEOKUK	Jun-55	150-R2.5	-1	2.25
333	WATER WHEELS, TURBINES AND GENERATORS				
	OSAGE	Jun-47	95-S0	-7	2.86
	TAUM SAUK	Jun-89	95-S0	-23	1.98
	KEOKUK	Jun-55	95-S0	-9	2.76
334	ACCESSORY ELECTRIC EQUIPMENT				
	OSAGE	Jun-47	70-R1.5	-1	2.97
	TAUM SAUK	Jun-89	70-R1.5	-3	1.70
	KEOKUK	Jun-55	70-R1.5	-1	2.53
335	MISCELLANEOUS POWER PLANT EQUIPMENT				
	OSAGE	Jun-47	55-R0.5	0	4.27
	TAUM SAUK	Jun-89	55-R0.5	0	2.05
	KEOKUK	Jun-55	55-R0.5	0	2.97
335.21	MISCELLANEOUS POWER PLANT EQUIPMENT - FURNITURE				
	OSAGE		20-SQ	0	5.00
	TAUM SAUK		20-SQ	0	5.00
	KEOKUK		20-SQ	0	5.00
335.22	MISCELLANEOUS POWER PLANT EQUIPMENT - OFFICE				
	OSAGE		15-SQ	0	6.67
	TAUM SAUK		15-SQ	0	6.67
	KEOKUK		15-SQ	0	6.67
335.23	MISCELLANEOUS POWER PLANT EQUIPMENT - COMPUTERS				
	OSAGE		5-SQ	0	20.00
	TAUM SAUK		5-SQ	0	20.00
	KEOKUK		5-SQ	0	20.00
336	ROADS, RAILROADS AND BRIDGES				
	OSAGE	Jun-47	55-R0.5	0	
	TAUM SAUK	Jun-89	55-R0.5	0	1.25
	KEOKUK	Jun-55	55-R0.5	0	1.14

AMEREN MISSOURI
ELECTRIC DIVISION
SUMMARY OF ESTIMATED SURVIVOR CURVES, NET SALVAGE PERCENT, AND ANNUAL DEPRECIATION RATES

	DEPRECIABLE GROUP	PROB. RET. DATE	SURVIVOR CURVE	NET SALVAGE PERCENT	DEPRECIATION RATE
	OTHER PRODUCTION PLANT				
341	STRUCTURES AND IMPROVEMENTS		40-S2	-5	2.43
341.2	STRUCTURES AND IMPROVEMENTS - SOLAR		25-R4	0	4.03
341.4	STRUCTURES AND IMPROVEMENTS WIND				
	ATCHISON WIND	Jun-51	60-R2.5	0	3.37
	HIGH PRAIRIE WIND	Jun-50	60-R2.5	0	3.48
342	FUEL HOLDERS, PRODUCERS AND ACCESSORIES		45-R2.5	-5	2.04
344	GENERATORS - OTHER CTS		45-R4	-5	1.64
344.1	GENERATORS - MARYLAND HEIGHTS LANDFILL CTG		12-S2.5	40	0.83
344.2	GENERATORS - SOLAR		25-S1.5	0	5.13
344.4	GENERATORS - WIND				
	ATCHISON WIND	Jun-51	40-R2.5	-1	3.58
	HIGH PRAIRIE WIND	Jun-50	40-R2.5	-1	3.66
345	ACCESSORY ELECTRIC EQUIPMENT		45-R2.5	-5	1.68
345.2	ACCESSORY ELECTRIC EQUIPMENT - SOLAR		25-S2.5	0	4.03
345.4	ACCESSORY ELECTRIC EQUIPMENT - WIND				
	ATCHISON WIND	Jun-51	40-R2.5	-1	3.54
	HIGH PRAIRIE WIND	Jun-50	40-R2.5	-1	3.66
346	MISCELLANEOUS POWER PLANT EQUIPMENT		27-L2	0	1.65
346.2	MISCELLANEOUS POWER PLANT EQUIPMENT - SOLAR		20-S2.5	0	4.95
346.21	MISCELLANEOUS POWER PLANT EQUIPMENT - FURNITURE		20-SQ	0	5.00
346.22	MISCELLANEOUS POWER PLANT EQUIPMENT - OFFICE		15-SQ	0	6.67
346.23	MISCELLANEOUS POWER PLANT EQUIPMENT - COMPUTERS		5-SQ	0	20.00
346.4	MISCELLANEOUS POWER PLANT EQUIPMENT - WIND				
	ATCHISON WIND	Jun-51	35-S2.5	0	2.36
	HIGH PRAIRIE WIND	Jun-50	35-S2.5	0	2.63
	OUTLAW WIND		35-S2.5	0	2.60
352	STRUCTURES AND IMPROVEMENTS		70-R2.5	-5	1.59
353	STATION EQUIPMENT		60-S1	-10	1.88
354	TOWERS AND FIXTURES		75-R4	-50	2.78
355	POLES AND FIXTURES		60-R3	-100	3.39
356	OVERHEAD CONDUCTORS AND DEVICES		75-R3	-40	1.82
359	ROADS AND TRAILS		75-R4	0	
	DISTRIBUTION PLANT				
361	STRUCTURES AND IMPROVEMENTS		60-R2	-5	1.74
362	STATION EQUIPMENT		60-R2	-10	1.83
364	POLES AND FIXTURES		58-L2.5	-150	3.78
365	OVERHEAD CONDUCTORS AND DEVICES		60-R0.5	-50	2.26
366	UNDERGROUND CONDUIT		75-R3	-50	2.12
367	UNDERGROUND CONDUCTORS AND DEVICES		57-R2	-40	2.58
368	LINE TRANSFORMERS		46-S1	0	1.98
369.01	OVERHEAD SERVICES		55-R2	-170	3.28
369.02	UNDERGROUND SERVICES		65-R3	-90	2.43
370	METERS		28-S0.5	-5	4.39
370.1	METERS - AMI		20-S2.5	-5	5.35
371	INSTALLATIONS ON CUSTOMERS' PREMISES		30-O1	0	1.23
373	STREET LIGHTING AND SIGNAL SYSTEMS		40-O1	-30	2.47

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	DEPRECIABLE GROUP	PROB. RET. DATE	SURVIVOR CURVE	NET SALVAGE PERCENT	DEPRECIATION RATE
	GENERAL PLANT				
390	STRUCTURES AND IMPROVEMENTS		50-R1	-10	2.32
390.01	MISCELLANEOUS OLD STRUCTURES		45-S0	-10	4.07
390.05	STRUCTURES AND IMPROVEMENTS - TRAINING ASSETS		5-SQ	0	20.00
391	OFFICE FURNITURE AND EQUIPMENT - FURNITURE		20-SQ	0	5.00
391.2	OFFICE FURNITURE AND EQUIPMENT - PERSONAL COMPUTERS		5-SQ	0	20.00
391.3	OFFICE FURNITURE AND EQUIPMENT- EQUIPMENT		15-SQ	0	6.67
392	TRANSPORTATION EQUIPMENT		11-R2	15	5.88
392.05	TRANSPORTATION EQUIPMENT - TRAINING ASSETS		5-SQ	0	20.00
393	STORES EQUIPMENT		20-SQ	0	5.00
394	TOOLS, SHOP AND GARAGE EQUIPMENT		20-SQ	0	5.00
394.05	TOOLS, SHOP AND GARAGE EQUIPMENT - TRAINING ASSETS		5-SQ	0	20.00
395	LABORATORY EQUIPMENT		20-SQ	0	5.00
396	POWER OPERATED EQUIPMENT		15-L1.5	15	6.45
397	COMMUNICATION EQUIPMENT		15-SQ	0	6.67
397.05	COMMUNICATION EQUIPMENT - TRAINING ASSETS		5-SQ	0	20.00
398	MISCELLANEOUS EQUIPMENT		20-SQ	0	5.00