Exhibit No.:	
Issues:	*Depreciation of Plant*
Witness:	*Jolie L. Mathis*
Sponsoring Party:	*MoPSC Staff*
Type of Exhibit:	*Direct Testimony*
Case Nos.:	*EC-2002-1*
Date Testimony Prepared:	*March 1, 2002*

MISSOURI PUBLIC SERVICE COMMISSION

UTILITY SERVICES DIVISION

DIRECT TESTIMONY

FILED[3]

MAR 0 1 2002

Missouri Public Service Commission

OF

JOLIE L. MATHIS

UNION ELECTRIC COMPANY d/b/a AMERENUE

CASE NO. EC-2002-1

Jefferson City, Missouri
March 2002

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UNION ELECTRIC COMPANY

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DIRECT TESTIMONY

OF

JOLIE L. MATHIS

UNION ELECTRIC COMPANY

d/b/a AMERENUE

CASE NO. EC-2002-1

Q. Please state your name and business address.

A. Jolie L. Mathis, P.O. Box 360, Jefferson City, MO 65102.

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

A. I am employed by the Missouri Public Service Commission (Commission) as an Engineer in the Engineering and Management Services Department.

Q. What are your duties as an Engineer in the Engineering and Management Services Department?

A. I am responsible for depreciation calculations and studies of companies regulated by the Commission.

Q. Would you please state briefly your qualifications, educational background and experience?

A. I graduated from Prairie View A&M University of Texas in August of 1993, with a Bachelor of Science degree in Electrical Engineering. During my college years I had internships with Allied Signal Aerospace Company, Missouri Public Service Company and Sprint United Telephone Co. – Midwest Division. In 1994 I accepted my current position. I have received formal training from Depreciation Programs, Inc., Kalamazoo, Michigan. Topics included actuarial and simulated service life analysis and techniques, forecasting life, forecasting salvage and cost of removal, and models for analyzing both aged and unaged data.

Q. Have you previously filed testimony with the Commission?

A. Yes, I have. Attached as Schedule 1 to my direct testimony is a list of cases in which I have previously filed testimony.

Q. Did you file testimony on the same issues in the Staff's previous audit of Union Electric Company d/b/a Ameren UE (UE or Company) in Case No. EC-2002-1?

A. Yes, I did.

Q. What is the purpose of your testimony in this case?

A. The purpose of my testimony is to present the Commission Staff's (Staff's) position and methods on: 1) supporting the depreciation rate schedule for UE, attached as Schedule 2 to this testimony, which the Staff has developed for purposes of its complaint against UE; 2) to discuss the elimination of net salvage from depreciation calculations, which the Staff believes is appropriate for the determination of depreciation expense; and 3) to discuss the treatment of the theoretical reserve imbalance. I am addressing the same issues as previously filed in this case.

Q. When were depreciation rates for UE last ordered by the Commission?

A. Depreciation rates were last ordered in Case No. ER-83-163 on July 6, 1983, excluding Callaway Nuclear Power Plant and the coal cars account. On that date the Commission issued a Report And Order that, among other things, directed that "Union Electric shall implement and book new depreciation rates as of August 1, 1983 as specified in paragraph 4 of the stipulation and agreement."

Q. Has the Staff conducted a depreciation study of the electric utility property of UE?

A. Yes. I performed a depreciation study based on the Company's records reflecting data up to year-end 2000. I studied 26 out of the 51 accounts, which represent 91% of electric plant in service with the exclusion of the nuclear production plant accounts.

Q. Did you tour the electric facilities of UE?

A. Yes. The Staff conducted a field inspection and discussed plant operations and plans for property retirement with local UE operators at several locations. Those locations included:

Coal Fired Plant	Hydroelectric Plant
Labadie (4 units)	Osage (River Dam)
Rush Island (2 units)	Taum Sauk (Pumped Storage)
Meramec (4 units)	
Sioux (2 units)	

The Sioux Plant was inspected in November 2000; I inspected the remaining plants in the Spring of 2001, with the exclusion of the Callaway Plant.

Q. Why didn't you inspect the Callaway Plant?

A. The Callaway Plant operates pursuant to an operating license approved by the Nuclear Regulatory Commission (NRC). The operating license for Callaway was approved by the NRC for 40 years and expires in 2024. The Staff has reflected the depreciable life of Callaway consistent with the current operating license. The Callaway plant is also subject to a separate decommissioning statute and Commission rule than other UE generating facilitieps. The rule and statute provide for the establishment of a fund to decommission Callaway at the expiration of its current operating license.

DEPRECIATION CONCEPTS

Q. Would you please define depreciation?

A. Yes. The National Association of Railroad and Utilities Commissioners in 1958 approved this definition:

> "Depreciation," as applied to depreciable utility plant, means 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 cause 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.
> [Source: Public Utility Depreciation Practices, August 1996, Published by the National Association of Regulatory Utility Commissioners]

Q. What does this definition mean to you?

A. This definition means that depreciation is a cost of providing service and that a public utility should recover the capital invested in equipment needed to provide the required service over the property's service life.

Q. Does Staff believe that depreciation should be used for other financial objectives?

A. No. The text <u>Public Utility Depreciation Practices,</u> published in August 1996 by the National Association of Regulatory Utility Commissioners (NARUC), addressed this issue:

> It is essential to remember that depreciation is intended only for the purpose of recording the periodic allocation of cost in a manner properly related to the useful life of the plant. It is not intended,

for example, to achieve a desired financial objective or to fund modernization programs.

Q. How did you determine the annual accrual for the Company in this case?

A. I divided the original cost of property by its average service life (ASL).

Q. What is the ASL?

A. The ASL, in years, is the average expected life of all units of a group of property, regardless of the placement date. The ASL is determined by actuarial analysis of records of annual additions, retirements by vintage and balances, as well as information provided by engineering and operations personnel. Survivor curve estimates from other electric companies are also considered.

Q. How did you determine the ASLs used in your depreciation rate calculations?

A. I used the survivor curve method.

Q. Please discuss the application of the survivor curve method.

A. It is a statistical method in which the underlying assumption is that if history does tend to repeat itself, the service life of the new unit of property will be reflected in the history of the retired units of that property.

UE's historical mortality data for an account is plotted and the stub curve (curve representing dollars surviving that does not reach 0%) is compared to the known shape of a set of Iowa curves. Survivor curve models, such as the Iowa curves, are widely used to simplify life analysis and forecasting. These curves were developed at the Iowa State College's Iowa Engineering Experiment Station 65 years ago. Three of the four families of curves include a base group of 176 industrial property mortality curves, and 18 types, published in Bulletin 125 of Iowa State University's Engineering Research Institute, entitled "Statistical Analysis of Industrial Property Retirements."

The classification of the survivor curves was made according to whether the mode (highest point) of the frequency curves was to the left, to the right or comparable with average service life. The result included six left modal (L0, L1, L2, L3, L4, L5); five right modal (R1, R2, R3, R4, R5); and seven symmetrical curves (S0, S1, S2, S3, S4, S5, S6). In 1957, a fourth family was presented consisting of the four "O" type survivor curves (O1, O2, O3, O4). Today, these survivor curve types are used extensively in public utility depreciation studies.

Q. How do you determine the ASL from these curves?

A. The area under the chosen Iowa curve represents the ASL for that unit of property.

Q. What is useful in evaluating which type curve, with its life parameter, most nearly matches the stub survivor curve?

A. The criterion used in determining a good fit is the residual measure shown on the printed curve fitting output. The residual measure is the square root of the average difference, squared, between the percents surviving on the fitted smooth curve and the stub curve. The lower the residual measure is, the better the degree of conformity. The range of fit shown opposite the residual measure indicates the age range used in the curve fitting process and computation of the residual measure. The survivor curve graph and residual measure table for Account 392 is attached to my testimony as Schedule 3, as an example.

Q. Please describe what may be found in Account 392.

A. Account 392 - Transportation Equipment contains cars (standard and compact), dump trucks, flat bed trucks, pick-up trucks, tractors, and boats.

Q. Please explain your approach to the determination of the average service life for Account 392.

A. The life ordered in 1983 was 11 years. I am recommending a shorter life of 10 years. The survivor curve method was used against two sets of data: an experience band of 1985-2000, and a placement band of 1980 to 2000, resulting in an R0.5 Iowa curve shape with an ASL of 10 years.

Q. What are the other series of steps the depreciation engineer performs to determine the ASL of each account?

A. Engineering judgment is utilized to determine if the ASL for current plant in service should be altered from the ASL determined from historical experience. Meetings are held with Company engineers and operations personnel along with tours of Company facilities. Past and present plant operations and plant maintenance is discussed to become knowledgeable about future projects anticipated by management, all of which may have an effect on ASL's of current plant.

Q. What parameters did you use to calculate your recommended depreciation rates?

A. Each life analysis is based on a method, procedure and technique.

Q. Please define those terms as they relate to depreciation.

A. The method is a pattern of depreciation in relation to an accounting period, such as the straight-line method. The procedure is the grouping of assets, such as Broad Group, where all units of plant within a particular depreciation category, usually a plant account or subaccount, are considered as a single group. The technique refers to the portion of the average life used in the calculation of depreciation, such as whole life, which bases the depreciation rate on the estimated ASL of the plant category.

Q. What method, procedure and technique did you use in your depreciation study?

A. I used the straight-line method, the broad group procedure, and the whole life technique, excluding net salvage from the formula.

NET SALVAGE

Q. Would you please define net salvage?

A. Net salvage is the gross salvage for the property retired, less its cost of removal. Gross salvage is the amount recorded for the property retired due to the sale, reimbursement or reuse of the property. Cost of removal is the cost incurred in connection with the retirement of depreciable plant from service.

Q. What is the whole life depreciation rate formula?

A. The formula is:

[Depreciation Rate = (100% - Net Salvage%)/Average Service Life]

Q. What are you recommending for the treatment of net salvage in this case?

A. Future net salvage cost (the marketable value of retired plant minus the plant's cost of removal), that will not occur in most cases for several decades, should not be collected from customers in the amount estimated by the whole life depreciation rate formula.

Q. What is your alternative to using the whole life formula to collect future net salvage?

A. My solution is to remove the net salvage factor from the whole life formula for depreciation rate determination. Rather, depreciation should be the determination of average service life and a subsequent depreciation rate that recovers the capital cost of the original investment. Net salvage cost will be based on a current expense determination made by the Staff auditors. See the direct testimony of Staff Accounting witness Greg Meyer. Net salvage costs that may occur far in the future should not be collected from customers until they occur.

NET SALVAGE COST

Q. What is net salvage cost?

A. Net salvage cost is the collection of any scrap or resale value of the retired plant less the cost to remove plant at interim and/or final retirement dates. Currently, for most companies, the cost to remove plant exceeds the scrap value of the same plant when all accounts are combined; therefore, it is reasonable to consider net salvage a cost. It is the Staff's proposal that net salvage cost be separated into two types as has been historically recognized by the Commission.

Q. Can you explain the two types of net salvage cost recognized, in the past, by the Commission?

A. The Commission has historically recognized both "final net salvage cost" and "interim net salvage cost" of life span property. Examples of life span property subject to "interim net salvage cost" and "final net salvage cost" would be plant, such as buildings, gas holders and power plants. Interim retirements are the retirement of units of plant during the life of a life span type property. These interim retirements cause an "interim net salvage cost" as will be explained later. A final retirement occurs when all units of a life span property in a specific account are retired together, regardless of age. A final retirement causes a "final retirement cost."

There are final retirements of plant in mass property accounts, also (accounts with many units of plant that are not part of a larger unit, i.e., mains, services, poles, etc.). Mass property retirements are booked frequently and, usually, there are many units retired each year. These mass property retirements also cause a "final net salvage cost." Both the "interim retirement cost" of life span property accounts and the "final retirement cost" of mass property accounts can be evaluated using the same methodology. The Staff auditors evaluate and determine an aggregate net salvage cost for all of these retirements and include it as a recurring expense with other audit results. This will provide benefits to the regulated utility companies and their customers.

Q. How would the Staff make this separation of net salvage cost into two types?

A. The final retirement of a life span property frequently includes a major demolition project and a rehabilitation of the site where the plant was located (greenfielding). These projects do not occur frequently and are normally after a long "in service" period. For example, the Laclede Gas Company's gas holders in St. Louis are in the range of 100 years old. Their removal will be the final retirement of a life span property. The responsibility to determine this type of net salvage cost (life span "final retirement cost") would remain with the depreciation engineers due to the need to evaluate demolition and "greenfielding" projects. This is one of the two types of net salvage cost. UE does not currently have a greenfielding project.

The other type of net salvage cost includes two separate values that will be determined by the Staff auditors as an expense item. One value is the "interim net salvage cost" of life span property and the other value is the "final net salvage cost" of mass property. Life span property's units of plant may be retired and replaced several times during the life of the life span property. For example, if the roof on a building is considered a unit of plant, it may need to be retired and replaced every 20 years while the building will remain in service for 100 years or more. Therefore, the roof may be replaced four or five times during the life span of the building. These retirements are interim retirements and occur repeatedly, and with a reasonable frequency. Also, the final retirements of plant in the mass property accounts, like mains for gas and water or poles for electric, occur with a reasonable frequency. Retirements from mass property accounts such as mains, services and meters tend to be relatively constant from year to year with some trends due to growth of the account or other events such as regulatory requirements to replace old services. This is the type of net salvage cost that is determined as an expense by the Staff auditors in this case.

Q. Has the Commission ruled on the net salvage issue in any previous cases?

A. Yes. In Case No. GR-99-315, Laclede Gas Company, the Commission ruled that current depreciation rates should reflect a net salvage component of the depreciation rate that, when multiplied by the plant balance, gives an annual accrual consistent with the current net salvage amount experienced by the Company. More recently, in Case No. ER-2001-299, the Empire District Electric Company, the Commission found "that net salvage cost considered in setting rates should be based on historical net salvage cost that Empire has actually incurred in the recent past and that it should be treated as an expense."

THEORETICAL RESERVE

Q. Would you please define theoretical reserve?

A. Theoretical reserve is the calculated balance that would be in the accumulated depreciation reserve account if recommended depreciation parameters were used.

Q. Will you please discuss the theoretical reserve in this case?

A. Yes. The actual 2000 reserve for the 26 accounts is $2,480,149,133. The Staff's theoretical reserve for the 26 accounts is $1,498,481,336. The Company is over-accrued by $981,667,797.

Q. How much of that over-accrual number is related to the exclusion of net salvage from the whole life depreciation formula?

A. Approximately $345 million is tied to the removal of net salvage from the formula, and the remaining $637 million to the extension of life parameters.

Q. How do you recommend that this over-accrual in theoretical reserve be treated?

A. Due to the size of the over-accrual in the theoretical reserve, Staff recommends an amortization period of 40 years. This time period is sufficient in length to allow the over-accrual to be corrected while allowing adjustments to be made to the process if unexpected facts and conditions dictate. Also, the amortization period is short enough to allow current consumers a significant benefit from the correction of this prior over-recovery.

STAFF'S POSITION FOR THIS CASE

Q. What is the annual accrual amount for the Company based on September 2001 plant balances in Schedule 2?

A. I have determined that the annual depreciation accrual based on September 2001 plant balances should be $200,965,704.

Q. What is the combined total of net salvage cost and the annual depreciation accrual?

A. The combined total of the annual expense for net salvage cost is $9,801,621 plus the annual accrual of $200,965,704 equals $210,767,325. The Staff auditors determined the annual expense for net salvage cost.

Q. Is this amount greater, the same or less than the annual accrual using the currently ordered rate?

A. It is less. Using the currently ordered rates, the annual accrual would be $264,254,879, which is $53,487,554 more than the combined total.

Q. Why is the annual accrual using currently ordered rates higher than the combined total?

A. As has been discussed throughout this testimony, the currently ordered rates include a net salvage cost determination that estimates unknown future cost in the current annual accrual.

Q. What actions do you propose for this case based on your information and determinations?

A. It is my proposal that: 1) the depreciation rates and average service lives given in Schedule 2 be ordered; 2) the net salvage cost as explained in my testimony be ordered as an expense in the amount presented by the Staff auditors; and 3) the Commission approves a 40-year amortization of the $981,667,797 over-recovery of the theoretical reserve from past utility customers at $24,541,695 per year.

Q. Does this conclude your direct testimony?

A. Yes, it does.

BEFORE THE PUBLIC SERVICE COMMISSION

OF THE STATE OF MISSOURI

The Staff of the Missouri Public Service Commission, Complainant,	)	
vs.	)	Case No. EC-2002-1
Union Electric Company, d/b/a AmerenUE, Respondent.	)	

AFFIDAVIT OF JOLIE L. MATHIS

STATE OF MISSOURI)
) ss.
COUNTY OF COLE)

Jolie L. Mathis, is, of lawful age, and on her oath states: that she has participated in the preparation of the foregoing Direct Testimony in question and answer form, consisting of 14 pages to be presented in the above case; that the answers in the foregoing Direct Testimony were given by her; that she has knowledge of the matters set forth in such answers; and that such matters are true and correct to the best of her knowledge and belief.

Jolie L. Mathis

Jolie L. Mathis

Subscribed and sworn to before me this 28th day of February, 2002.

D Suzie Mankin

Notary Public

D SUZIE MANKIN
NOTARY PUBLIC STATE OF MISSOURI
COLE COUNTY
MY COMMISSION EXP. JUNE 21,2004

Jolie Mathis

Schedule of Testimony Filings

Case Number	Company
GA-96-130	Missouri Pipeline Company
TO-96-147	Alltel Missouri, Inc.
GA-97-11	Missouri Pipeline Co.
GM-97-70	Atmos Energy Corp. & United Cities Gas
GR-97-272	Associated Natural Gas
HR-99-245	St. Joseph Light & Power
WR-99-326	United Water Missouri
WR-2000-281	Missouri-American Water Company
WR-2000-282	Missouri-American Water Company
EC-2002-1	Union Electric Company, d/b/a AmerenUE

UNION ELECTRIC COMPANY d/b/a AMEREN UE (EC-2002-1)
DEPRECIATION DETERMINATION SPREADSHEET

Account No.	Title	Plant Original Cost Sep-01	Ordered Life (Yr.)	Ordered Net Salvage (%)	Ordered Deprec. Rate (%)	Staff's Proposal Life (Yr.)	Staff's Proposal Curve	Staff's Proposal Deprec. Rate (%)	Ordered Annual Accrual	Staff's Annual Accrual	2000 Accrued Reserve	2000 Theoretical Reserve
	Meramec Steam Production Plant											
311	Structures & Improvements	25,076,266	35	(1)	2.89%	69	R2.5	1.45%	724,704	363,606	18,696,718	10,619,279
312	Boiler Plant Equipment	259,919,336	32	(2)	3.19%	54	R1.5	1.85%	8,291,427	4,808,508	107,130,804	54,897,564
314	Turbogenerator Units	60,223,319	35	2	2.80%	62	R2.5	1.61%	1,686,253	969,595	49,985,039	23,836,091
315	Acessory Electric Equipment	16,221,271	35	3	2.77%	55	R3	1.82%	449,329	295,227	15,029,723	8,339,051
316	Misc. Power Plant Equipment	10,805,277	29	6	3.24%	29		3.44%	350,091	371,702	3,191,101	
	Sioux Steam Production Plant											
311	Structures & Improvements	21,648,838	35	(1)	2.89%	69	R2.5	1.45%	625,651	313,908	11,209,173	5,936,720
312	Boiler Plant Equipment	277,295,784	32	(2)	3.19%	54	R1.5	1.85%	8,845,736	5,129,972	77,361,815	47,030,871
314	Turbogenerator Units	61,018,161	35	2	2.80%	62	R2.5	1.61%	1,708,509	982,392	23,044,878	12,712,445
315	Acessory Electric Equipment	17,194,454	35	3	2.77%	55	R3	1.82%	476,286	312,939	9,077,610	5,658,705
316	Misc. Power Plant Equipment	7,176,942	29	6	3.24%	29		3.44%	232,533	246,887	2,082,787	
	Venice Steam Production Plant											
311	Structures & Improvements	18,201,764	35	(1)	2.89%	69	R2.5	1.45%	526,031	263,926	20,428,563	12,810,581
312	Boiler Plant Equipment	30,192,173	32	(2)	3.19%	54	R1.5	1.85%	963,130	558,555	21,994,084	11,524,653
314	Turbogenerator Units	20,584,218	35	2	2.80%	62	R2.5	1.61%	576,358	331,406	20,001,652	9,860,204
315	Acessory Electric Equipment	8,285,969	35	3	2.77%	55	R3	1.82%	229,521	150,805	9,689,171	5,979,508
316	Misc. Power Plant Equipment	2,044,940	29	6	3.24%	29		3.44%	66,256	70,346	872,363	
	Labadie Steam Production Plant											
311	Structures & Improvements	58,109,680	35	(1)	2.89%	69	R2.5	1.45%	1,679,370	842,590	27,861,907	14,912,393
312	Boiler Plant Equipment	524,858,450	32	(2)	3.19%	54	R1.5	1.85%	16,742,985	9,709,881	246,447,680	134,406,500
314	Turbogenerator Units	126,119,636	35	2	2.80%	62	R2.5	1.61%	3,531,350	2,030,526	70,386,125	41,114,157
315	Acessory Electric Equipment	46,209,121	35	3	2.77%	55	R3	1.82%	1,279,993	841,006	27,165,272	17,345,529
316	Misc. Power Plant Equipment	14,530,478	29	6	3.24%	29		3.44%	470,787	499,848	6,204,256	
	Rush Island Steam Production Plant											
311	Structures & Improvements	45,111,396	35	(1)	2.89%	69	R2.5	1.45%	1,303,719	654,115	30,883,726	15,379,667
312	Boiler Plant Equipment	277,463,052	32	(2)	3.19%	54	R1.5	1.85%	8,851,071	5,133,066	156,377,490	75,103,937
314	Turbogenerator Units	88,403,327	35	2	2.80%	62	R2.5	1.61%	2,475,293	1,423,294	56,191,251	29,785,226
315	Acessory Electric Equipment	20,734,700	35	3	2.77%	55	R3	1.82%	574,351	377,372	12,108,813	7,347,738
316	Misc. Power Plant Equipment	8,130,660	29	6	3.24%	29		3.44%	263,433	279,695	3,580,450	
312.03	Boiler Plant Equipment - Aluminum Coal Cars	121,147,802	22	0	4.55%	22	R3	4.55%	5,512,225	5,512,225	28,507,805	26,898,204
	Nuclear Production Plant											
321	Structures and Improvements	861,739,336	40	0	2.60%	40		2.50%	22,405,223	21,543,483	334,683,353	
322	Reactor Plant Equipment	844,608,320	40	4	2.60%	40		2.50%	21,959,816	21,115,208	290,746,799	
323	Turbogenerator Units	438,768,373	40	0	2.60%	40		2.50%	11,407,978	10,969,209	172,652,686	
324	Accessory Electric Equipment	229,235,528	40	1	2.60%	40		2.50%	5,960,124	5,730,888	92,017,410	
325	Misc. Power Plant Equipment	143,496,161	40	2	2.60%	40		2.50%	3,730,900	3,587,404	21,210,806	

Schedule 2-1

UNION ELECTRIC COMPANY d/b/a AMEREN UE (EC-2002-1)
DEPRECIATION DETERMINATION SPREADSHEET

Account No.	Title	Plant Original Cost Sep-01	Ordered Life (Yr.)	Ordered Net Salvage (%)	Ordered Deprec. Rate (%)	Staff's Proposal Life (Yr.)	Staff's Proposal Curve	Staff's Proposal Deprec. Rate (%)	Ordered Annual Accrual	Staff's Annual Accrual	2000 Accrued Reserve	2000 Theoretical Reserve
	Osage Hydraulic Production Plant											
331	Structures and Improvements	3,183,720	91	0	1.10%	91		1.10%	35,021	35,021	1,252,653	
332	Reservoirs, Dams, and Waterways	23,853,503	85	(1)	1.19%	85		1.18%	283,857	281,471	12,162,985	
333	Water Wheels, Turbines, and Generators	13,540,665	96	0	1.04%	96		1.04%	140,823	140,823	6,390,685	
334	Accessory Electric Equipment	3,230,581	90	(2)	1.13%	90		1.11%	36,506	35,859	1,113,646	
335	Misc. Power Plant Equipment	1,015,077	74	5	1.28%	74		1.35%	12,993	13,704	469,925	
336	Roads, Railroads, and Bridges	77,445	22	0	4.55%	22		4.55%	3,524	3,524	97,465	
	Keokuk Hydraulic Production Plant											
331	Structures and Improvements	3,608,633	91	0	1.10%	91		1.10%	39,695	39,695	1,237,608	
332	Reservoirs, Dams, and Waterways	11,547,355	85	(1)	1.19%	85		1.18%	137,414	136,259	5,151,427	
333	Water Wheels, Turbines, and Generators	22,965,729	96	0	1.04%	96		1.04%	238,844	238,844	5,714,032	
334	Accessory Electric Equipment	3,515,203	90	(2)	1.13%	90		1.11%	39,722	39,019	1,945,564	
335	Misc. Power Plant Equipment	1,664,693	74	5	1.28%	74		1.35%	21,308	22,473	492,636	
336	Roads, Railroads, and Bridges	61,759	22	0	4.55%	22		4.55%	2,810	2,810	20,619	
	Taum Sauk Hydraulic Production Plant											
331	Structures and Improvements	6,283,837	91	0	1.10%	91		1.10%	69,122	69,122	1,458,589	
332	Reservoirs, Dams, and Waterways	22,105,904	85	(1)	1.19%	85		1.18%	263,060	260,850	8,443,305	
333	Water Wheels, Turbines, and Generators	35,349,473	96	0	1.04%	96		1.04%	367,635	367,635	5,605,244	
334	Accessory Electric Equipment	2,028,838	90	(2)	1.13%	90		1.11%	22,926	22,520	949,534	
335	Misc. Power Plant Equipment	585,116	74	5	1.28%	74		1.35%	7,489	7,899	383,380	
336	Roads, Railroads, and Bridges	45,570	22	0	4.55%	22		4.55%	2,073	2,073	46,008	
	Other Production Plant											
341	Structures and Improvements	1,258,161	25	0	4.00%	25		4.00%	50,326	50,326	686,128	
342	Fuel Holders, Products, and Accessories	1,867,709	25	0	4.00%	25		4.00%	74,708	74,708	1,053,609	
344	Generators	53,508,705	25	0	4.00%	25		4.00%	2,140,348	2,140,348	33,325,815	
345	Accessory Electric Equipment	2,871,356	25	0	4.00%	25		4.00%	114,854	114,854	2,233,946	
346	Misc. Power Plant Equipment	95,334	25	0	4.00%	25		4.00%	3,813	3,813	213,510	
	Transmission Plant											
352	Structures and Improvements	7,020,591	79	(5)	1.33%	79		1.27%	93,374	89,162	1,759,339	
353	Station Equipment	190,637,994	50	0	2.00%	59	R3	1.69%	3,812,760	3,221,782	56,631,844	47,119,842
354	Tower and Fixtures	82,383,199	50	7	1.86%	50		2.00%	1,532,328	1,647,664	33,587,727	
355	Poles and Fixtures	76,382,450	43	(20)	2.79%	43		2.32%	2,131,070	1,772,073	29,193,434	
356	Overhead Conductors and Devices	111,408,800	60	13	1.45%	70	R3	1.43%	1,615,428	1,593,146	36,998,216	27,065,747
359	Roads and Trails	134,036	50	0	2.00%	50		2.00%	2,681	2,681	69,009	

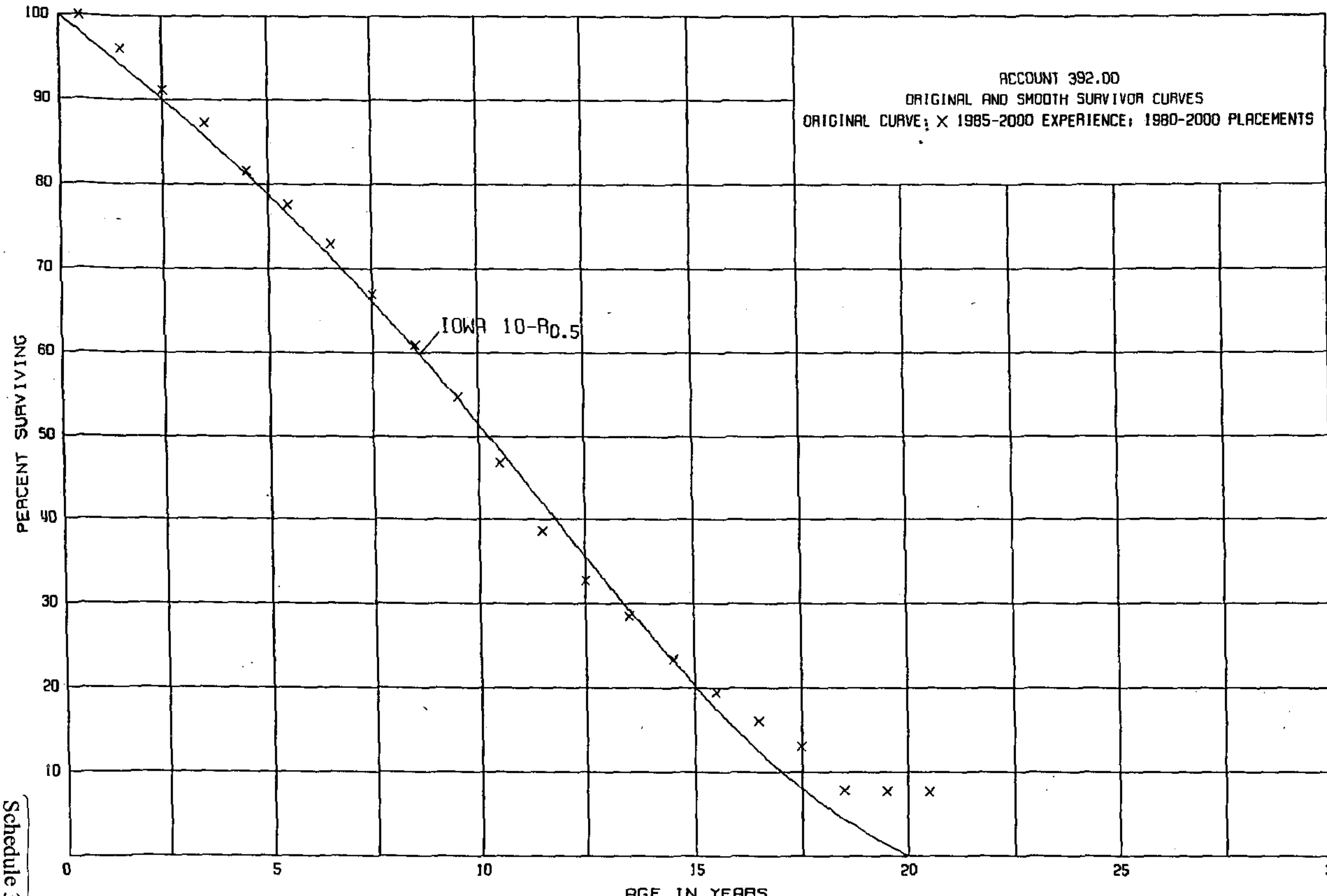
Schedule 2-2

UNION ELECTRIC COMPANY d/b/a AMEREN UE (EC-2002-1)
DEPRECIATION DETERMINATION SPREADSHEET

Account No.	Title	Plant Original Cost Sep-01	Ordered Life (Yr.)	Ordered Net Salvage (%)	Ordered Deprec. Rate (%)	Staff's Proposal Life (Yr.)	Staff's Proposal Curve	Staff's Proposal Deprec. Rate (%)	Ordered Annual Accrual	Staff's Annual Accrual	2000 Accrued Reserve	2000 Theoretical Reserve
	Distribution Plant											
361	Structures and Improvements	14,770,685	61	10	1.48%	61		1.64%	218,606	242,239	4,273,833	
362	Station Equipment	440,218,214	44	(5)	2.39%	56	R2.5	1.79%	10,521,215	7,879,906	183,269,074	124,329,856
364	Poles, Towers, and Fixtures	546,868,993	34	(127)	6.68%	41	R2.5	2.44%	36,530,849	13,343,603	439,274,966	166,014,727
365	Overhead Conductors and Devices	602,480,278	36	(15)	3.19%	48	R0.5	2.08%	19,219,121	12,531,590	219,487,216	110,139,521
366	Underground Conduit	127,382,861	84	(45)	1.73%	65	R3	1.54%	2,203,723	1,961,696	32,059,741	28,651,244
367	Underground Conductors and Devices	380,658,273	45	22	1.73%	53	R1.5	1.89%	6,585,388	7,194,441	80,445,868	71,804,348
368	Line Transformers	306,460,891	40	17	2.08%	46	L2	2.17%	6,374,387	6,650,201	93,501,094	86,714,886
369.001	Overhead Services	109,300,999	36	(197)	8.25%	37	S1.5	2.70%	9,017,332	2,951,127	99,457,120	37,015,001
369.002	Underground Services	104,720,437	45	(17)	2.60%	46	R3	2.17%	2,722,731	2,272,433	14,923,590	29,793,646
370	Meters	95,685,110	36	1	2.75%	30	L2.5	3.33%	2,631,341	3,186,314	25,215,475	27,864,291
371	Installations on Customer Premises	164,871	46	(1)	2.20%	46		2.17%	3,627	3,578	24,230	
373.00	Street Lighting and Signal Systems	87,435,094	23	(36)	5.91%	31	L0.5	3.23%	5,167,414	2,824,154	55,860,727	20,427,041
	General Plant											
390.0	Structures and Improvements	151,397,752	41	6	2.29%	42	S0.5	2.38%	3,467,009	3,603,266	32,386,977	38,749,404
391.0	Office Furniture and Equipment	29,558,569	28	8	3.29%	22	L0	4.55%	972,477	1,344,915	10,039,830	5,994,742
391.1	Mainframe Computers	1,364,248	*	*	3.29%	6	L0	16.67%	44,884	227,420	[illegible]	546,211
391.2	Personal Computers	13,952,144	*	*	3.29%	9	S2.5	11.11%	459,026	1,550,083	[illegible]	5,118,198
392.0	Transportation Equipment	72,434,870	11	12	8.00%	10	R0.5	10.00%	5,794,790	7,243,487	40,605,001	31,563,662
393.0	Stores Equipment	1,960,200	32	12	2.75%	32		3.12%	53,906	61,158	718,181	
394.00	Tools, Shop and Garage Equipment	9,000,346	45	18	1.82%	27	L0	3.70%	163,806	333,013	961,147	1,680,668
395.00	Laboratory Equipment	5,032,059	52	2	1.88%	22	L0	4.55%	94,603	228,959	524,546	1,120,963
396.00	Power Operated Equipment	10,592,862	18	23	4.28%	15	L2	6.67%	453,374	706,544	6,558,445	5,400,189
397.00	Communication Equipment	123,917,469	30	(5)	3.50%	18	R4	5.45%	4,337,111	6,753,502	33,497,709	59,868,126
398.00	Miscellaneous Equipment	446,618	20	5	4.75%	20		5.00%	21,214	22,331	228,000	
Analyzed Totals											2,480,149,133	1,498,481,336
Column Totals		6,602,590,011							264,254,879	200,965,704	3,567,693,210	n/a

* Sub-account did not exist when the last depreciation rates were ordered in 1983

Schedule 2-3


ACCOUNT 392.00
ORIGINAL AND SMOOTH SURVIVOR CURVES
ORIGINAL CURVE: × 1985-2000 EXPERIENCE; 1980-2000 PLACEMENTS
IOWA 10-R0.5
PERCENT SURVIVING
100
90
80
70
60
50
40
30
20
10
0
5
10
15
20
25
30
AGE IN YEARS

Schedule 3-1

ACCOUNT 392.00

SUMMARY OF CURVE FITTING RESULTS - PCT SURV BALANCED AREAS

PLACEMENT BAND 1980-2000 2 EXPERIENCE BAND 1985-2000

SURVIVOR CURVE	RESID MEAS	RANGE OF FIT	SURVIVOR CURVE	RESID MEAS	RANGE OF FIT*
10.0-S0	2.67	0 - 17	10.1-S0	2.49	4 - 17
10.0-S0.5	4.68	0 - 17	10.2-S0.5	4.45	4 - 17
10.0-S1	6.89	0 - 17	10.2-S1	6.80	4 - 17
10.1-R0.5	1.85	0 - 17	10.0-R0.5	1.81	4 - 17
10.0-R1	3.55	0 - 17	10.0-R1	3.99	4 - 17
10.0-R1.5	5.89	0 - 17	10.1-R1.5	6.40	4 - 17
10.8-L0	3.20	0 - 17	10.8-L0	3.61	4 - 17
10.6-L0.5	1.89	0 - 17	10.6-L0.5	2.03	4 - 17
10.3-L1	2.54	0 - 17	10.5-L1	1.85	4 - 17
10.2-L1.5	4.34	0 - 17	10.4-L1.5	3.75	4 - 17
10.2-O1	4.04	0 - 17	10.0-O1	3.80	4 - 17
11.4-O2	4.57	0 - 17	11.1-O2	4.40	4 - 17

* SEGMENT BETWEEN 85.0 AND 15.0 PERCENT SURVIVING.