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Witness: John J. Spanos
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Sponsoring Party: Ameren Missouri
Case No.: ER-2019-0335
Date: January 21, 2020

MISSOURI PUBLIC SERVICE COMMISSION
CASE NO. ER-2019-0335

REBUTTAL TESTIMONY OF
JOHN J. SPANOS
ON BEHALF OF
AMEREN MISSOURI

Camp Hill, Pennsylvania

January 21, 2020

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1 **I. INTRODUCTION AND PURPOSE**

2 **Q. PLEASE STATE YOUR NAME AND ADDRESS.**

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

5 **Q. ARE YOU THE SAME JOHN J. SPANOS WHO PREFILED DIRECT**
6 **TESTIMONY IN THIS MATTER?**

7 A. Yes.

8 **Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY?**

9 A. The purpose of my testimony is to rebut two aspects of the Staff Report filed by the
10 Missouri Public Service Commission Staff ("Staff") related to depreciation, to rebut
11 the depreciation-related contentions in the direct testimony of John A. Robinett on
12 behalf of the Office of Public Counsel ("OPC"), and to rebut the testimony of Brian
13 C. Andrews on behalf of the Missouri Industrial Energy Consumers ("MIEC").

14 **Q. WHAT IS THE SUBJECT OF YOUR REBUTTAL TESTIMONY?**

15 A. The subject of my testimony is depreciation. Specifically, I will address Staff's
16 proposed depreciation rates for general plant amortization accounts, Staff's proposed
17 accumulated depreciation adjustments, OPC's proposal with regard to other
18 production facilities, and MIEC's proposal to reallocate the book accumulated
19 depreciation for production facilities.

20 **II. REBUTTAL TO STAFF'S PROPOSALS**

21 **Q. WHAT DOES STAFF RECOMMEND?**

22 A. Staff makes two depreciation-related proposals. The first is to use whole life
23 depreciation rates for the general plant amortization accounts (including similar assets
24 in production plant accounts). Staff also recommends transfers of accumulated

1 depreciation for certain accounts or groups that have negative accumulated
2 depreciation balances.

3 **A. General Plant Amortization Accounting**

4 **Q. PLEASE EXPLAIN GENERAL PLANT AMORTIZATION ACCOUNTING.**

5 A. General plant amortization is used for accounts that have a large number of assets with
6 relatively small unit costs. Because the cost of accounting for these assets is often high
7 relative to the level of investment in the accounts (e.g., requiring periodic inventories
8 of assets such as chairs, desks or tools), most regulatory jurisdictions have adopted
9 amortization accounting for certain general plant accounts. Under amortization
10 accounting, an amortization period is established based on the expected useful life of
11 assets in the account. Once assets reach the age of the amortization they are retired
12 from the books, regardless of whether they are still physically in service. Ameren
13 Missouri currently uses amortization accounting for many general plant accounts as
14 well as for certain production plant accounts that include similar assets to the general
15 plant amortization accounts (I will refer to all of these accounts collectively as
16 "general plant amortization accounts").

17 **Q. PLEASE EXPLAIN THE DIFFERENCE BETWEEN YOUR PROPOSAL AND**
18 **STAFF'S PROPOSAL.**

19 A. In the depreciation study, I have used the remaining life technique. For the remaining
20 life technique, unrecovered costs (i.e., the original cost less net salvage less
21 accumulated depreciation) are allocated over the remaining time the plant in an
22 account is expected to remain in service. This approach ensures that the full service
23 value (original cost less net salvage) is recovered and contrasts with the whole life

1 technique, in which the level of accumulated depreciation is not considered when
2 calculating depreciation rates.

3 Ameren Missouri has proposed the remaining life technique for all assets in the
4 depreciation study submitted in this case and the remaining life technique was used
5 for the currently-approved and in effect depreciation rates. Similarly, Staff
6 recommends using the remaining life technique for all accounts but is proposing a
7 change from how current depreciation rates were set for the general plant amortization
8 accounts. For general plant amortization accounts, which includes subaccounts of 316,
9 325, 335 and 346, Staff recommends whole life depreciation rates. Contrary to the
10 assertions on page 146 of the Staff Report, a whole life depreciation rate does not
11 ensure that "[b]y the end of the amortization period the asset will be fully recovered."
12 Instead, because accumulated depreciation may not be the precise amount needed to
13 ensure full recovery, only remaining life depreciation rates will result in the full
14 recovery of the entire service value of assets.

15 **Q. PLEASE ILLUSTRATE HOW THE IMPLEMENTATION OF THE WHOLE**
16 **LIFE DEPRECIATION METHOD AS PROPOSED BY STAFF MAY NOT**
17 **ENSURE THAT ASSETS ARE FULLY RECOVERED BY THE END OF THE**
18 **AMORTIZATION PERIOD.**

19 A. The purpose of amortization accounting is to develop a constant depreciation rate and
20 systematically recover the full plant in service value of high volume, small dollar
21 assets. In other words, for assets that are placed in service with a 10 year amortization
22 period, the rate of recovery will be 10% and the assets will be on the books for 10
23 years, then retired. For example, a \$5,000 asset placed in service at the beginning of
24 2010 with a 10-year amortization period will have a rate of 10% and annual expense

1 of \$500 through 2019. At the end of 2019, the asset has a total accumulated
2 depreciation value of \$5,000. The asset is retired at the end of 2019 and is fully
3 recovered. In this simple example, both the whole life and remaining life method
4 properly recover the full service value by the end of the amortization period.

5 However, this simple example is not indicative of what Staff has done in order to
6 achieve the proper amortization rate for all general plant accounts. Using the 10-year
7 amortization period example, Staff has applied the whole life method on existing
8 assets in order to achieve the 10% rate without considering the level of the book
9 reserve which does not guarantee full recovery. For example, if the \$5,000 asset placed
10 in service in 2010 has a book reserve of \$2,000 after year 5 due to the past depreciation
11 rates for the account, then has a 10% rate applied for the last 5 years, then the book
12 reserve at the end of 2019 would be \$4,500. Therefore, using the whole life method,
13 the asset is not fully recovered since the accumulated depreciation (book reserve) for
14 the \$5,000 asset is only \$4,500 at time of retirement. This is what Staff has done for
15 all general plant amortization accounts.

16 **B. Accumulated Depreciation Adjustments**

17 **Q. WHAT IS THE BASIS FOR THE ACCUMULATED DEPRECIATION**
18 **ADJUSTMENTS PROPOSED BY STAFF?**

19 A. Staff proposes adjustments for accounts that have negative book reserves.

20 **Q. ARE ADJUSTMENTS NEEDED FOR ACCOUNTS THAT HAVE NEGATIVE**
21 **ACCUMULATED DEPRECIATION AMOUNTS?**

22 A. In general, if an account has a plant in service balance, a negative reserve balance does
23 not require an explicit adjustment since the remaining life technique will ensure the
24 full recovery of the unrecovered costs for the account – no more and no less. That is,

1 a negative reserve is not necessarily an issue that needs to be specifically addressed.
2 If, however, there is no remaining plant balance, an adjustment may be necessary to
3 ensure full recovery.

4 **Q. DO YOU AGREE WITH STAFF’S PROPOSALS?**

5 A. Staff’s proposals for the land rights accounts are small dollar adjustments for accounts
6 that are not included as depreciable accounts. I am not opposed in principle to
7 adjusting these amounts, although the adjustment is not necessary. These issues were
8 found by the Company during a normal review of the reserve amounts and the amounts
9 were properly reclassified during 2019. The negative accumulated depreciation
10 amount for Account 335 related to Osage are the result of high cost of removal and
11 will be recovered through the remaining life technique. The negative accumulated
12 depreciation amounts at the Taum Sauk Energy Center are specific to Account 332.
13 The remaining life technique will recover these costs over the remaining life of the
14 Taum Sauk Energy Center for this account, which is appropriate.

15 **III. REBUTTAL TO OPC’S PROPOSALS**

16 **Q. WHAT DOES MR. ROBINETT RECOMMEND?**

17 A. Mr. Robinett makes two recommendations:

18 [F]irst, that Ameren Missouri’s combustion turbines be analyzed either
19 individually or by facility location for depreciation rate assignments
20 using remaining life procedure; and second OPC recommends no
21 recovery of depreciation study expenses until the study is amended and
22 resubmitted to comply with 20 CSR 4240-3.175(1)(A)2D by providing
23 estimated retirement dates for the combustion turbines either
24 individually or by facility location.¹

¹ Robinett at 2:16-21.

1 **Q. WHY DOES MR. ROBINETT BELIEVE THAT THE DEPRECIATION**
2 **STUDY DOES NOT COMPLY WITH 20 CSR 4240-3.175(1)(A)2D?**

3 A. Based on his testimony, Mr. Robinett's complaint is that the depreciation study does
4 not use the life span method to study each other production facility (i.e., each
5 combustion turbine plant) individually. He interprets the Missouri Code of State
6 Regulations, and specifically 20 CSR 4240-3.175(1)(A)2D, to require that a
7 depreciation study analyze other production facilities by location and include
8 estimated retirement dates.

9 **Q. HAS THE COMMISSION APPLIED AND INTERPRETED THIS**
10 **LONGSTANDING COMMISSION RULE TO REQUIRE THAT STUDIES**
11 **USE THE LIFE SPAN METHOD WITH ESTIMATED RETIREMENT DATES**
12 **FOR EACH PRODUCTION FACILITY?**

13 A. No. The Commission has approved depreciation rates for other production facilities
14 (essentially the Company's combustion turbine plants) in previous rate cases using the
15 same approach as in the Company's study, including in each of the Company's last
16 three rate cases where depreciation rates were at issue.² Further, the Commission did
17 not even allow the Company to use the life span method for steam production facilities
18 until Case No. ER-2010-0036. As a result, based on past decisions, the Commission
19 has not interpreted 20 CSR 4240-3.175(1)(A)2D in the same manner as Mr. Robinett
20 (and neither has its Staff or OPC for that matter). The rule has not changed.

² File Nos. ER-2007-0002, ER-2010-0036, and ER-2014-0258.

1 **Q. FOR THE CURRENT DEPRECIATION STUDY, HAVE YOU STUDIED THE**
2 **OTHER PRODUCTION FACILITIES IN THE SAME MANNER AS IN**
3 **PREVIOUS DEPRECIATION STUDIES?**

4 A. Yes. I am not aware of any party challenging this approach in any of these previous
5 cases.

6 **Q. DO YOU DISAGREE WITH THE CONCEPT OF STUDYING THE OTHER**
7 **PRODUCTION FACILITIES USING THE LIFE SPAN METHOD?**

8 A. No. I have used the life span method for other production facilities in depreciation
9 studies for other utilities. However, for Ameren Missouri I elected to continue to use
10 the same approach as used in previous depreciation studies and study the other
11 production facilities for each account as a single group.

12 **Q. WHAT WOULD THE RESULT BE OF USING THE LIFE SPAN METHOD**
13 **FOR OTHER PRODUCTION FACILITIES?**

14 A. The result would be higher depreciation expense than Ameren Missouri has proposed.
15 Schedule JJS-R1 provides the results of studying the other production facilities in
16 accordance with Mr. Robinett's recommendation. For these calculations, I have used
17 a 40-year life span for most other production facilities, which is consistent with the
18 40-year average service life that has previously been adopted by the Commission for
19 other production accounts and is consistent with life spans used for similar facilities
20 for other utilities. The Company also has some older other production facilities that
21 are likely to be retired in the coming years. I have used a retirement date of 2028 for
22 these facilities.

23 The result of these calculations, which are consistent with Mr. Robinett's
24 recommendations, produces depreciation expense that is \$8,678,896 higher than I

1 have proposed in the depreciation study. If the Commission prefers to use the life span
2 method for other production facilities, I would have no objection to using the
3 depreciation rates in Schedule JJS-R1.

4 **Q. PLEASE ADDRESS MR. ROBINETT'S SECOND RECOMMENDATION**
5 **REGARDING THE RECOVERY OF COSTS FOR THE DEPRECIATION**
6 **STUDY.**

7 A. I disagree with Mr. Robinett's recommendation. First, it would be excessively punitive
8 to disallow the recovery of costs for a study that was conducted in a manner consistent
9 with those filed in previous cases and with depreciation rates for these accounts
10 calculated in a manner consistent with depreciation rates previously adopted by the
11 Commission. Second, the calculations provided in Schedule JJS-R1 satisfy the
12 analysis requested by Mr. Robinett and, thus, his point is moot.

13 **IV. REBUTTAL TO MIEC'S PROPOSALS**

14 **Q. WHAT DOES MIEC PROPOSE?**

15 A. MIEC witness Andrews proposes to reallocate accumulated depreciation amounts for
16 production plant accounts.

17 **Q. WHAT IS THE BASIS FOR MR. ANDREWS' PROPOSAL?**

18 A. Mr. Andrews' proposal is based on an analysis he performed comparing the book
19 accumulated depreciation (or "book reserve") to the theoretical reserve. From this
20 analysis, Mr. Andrews argues that Ameren Missouri's production plant is "over-
21 accrued" and that "it is appropriate to reallocate the actual book reserves."³

³ Andrews at 9.

1 **Q. DO YOU AGREE WITH THE CONCLUSIONS MR. ANDREWS DRAWS**
2 **FROM HIS ANALYSIS?**

3 A. No. As I will discuss in more detail, it is incorrect to emphasize the theoretical reserve
4 calculations to the degree Mr. Andrews does, particularly in light of potential changes
5 in expected retirement dates for the Company's coal-fired generating facilities.
6 Further, Mr. Andrews has not sufficiently reviewed the historical accounting for other
7 production facilities to determine the reasons for the levels of accumulated
8 depreciation in these accounts. Instead, a more detailed review of the reserves for the
9 Company's assets supports that it is not appropriate to reallocate the reserves as Mr.
10 Andrews' proposes and that doing so could result in more significant increases in
11 depreciation expense in future studies if current estimates of service lives are revised.

12 **Q. WHAT IS THE BOOK RESERVE?**

13 A. The book reserve, also referred to as the "book accumulated depreciation" or the
14 "accumulated provision for depreciation," is a running total of historical depreciation
15 activity. It is equal to the historical depreciation accruals, less retirements and cost of
16 removal, plus historical gross salvage. The book reserve also represents a reduction to
17 the original cost of plant when calculating rate base.

18 **Q. WHAT IS THE THEORETICAL RESERVE?**

19 A. The theoretical reserve is an estimate of the accumulated depreciation based on the
20 current plant balances and depreciation parameters (service life and net salvage
21 estimates) at a specific point in time. Put another way, it is, theoretically, what the
22 reserve would have been had the current plant balances utilized the same depreciation
23 parameters since the initial assets were placed in service.

24 **Q. IS THE THEORETICAL RESERVE THE "CORRECT" RESERVE?**

1 A. No, the theoretical reserve is an estimate based on the current plant balances and
2 current life and net salvage estimates. It can provide a benchmark of a Company's
3 reserve position, but it is not the "correct" reserve amount. The theoretical reserve will
4 change every time a study is performed. For example, if there is a change in the
5 estimated retirement date for a power plant, this will change the calculated theoretical
6 reserve.

7 **Q. WHAT IS A THEORETICAL RESERVE IMBALANCE?**

8 A. A theoretical reserve imbalance ("TRI" or "imbalance") is calculated as the difference
9 between a company's book accumulated depreciation, or book reserve, and the
10 calculated accrued depreciation, or theoretical reserve. When Mr. Andrews uses terms
11 such as "over-accrued" or "overstated," he is referring to the *theoretical* reserve
12 imbalance. I do not agree with this characterization, as it incorrectly implies that the
13 Company has recorded too much depreciation in the past. This is not the case – the
14 Company has recorded depreciation consistent with Commission-approved
15 depreciation rates and practices.

16 A theoretical reserve imbalance is merely a comparison of the book reserve to the
17 theoretical reserve at a single point in time based on the service life and net salvage
18 estimates. These estimates can and will evolve over time as more information is
19 available. In my experience, there have been many instances in which a perceived
20 "over-accrued" theoretical reserve imbalance turned out to actually be "under-
21 accrued" in subsequent depreciation studies.

22 **Q. DO ANY DEPRECIATION AUTHORITIES PROVIDE GUIDANCE WITH**
23 **REGARD TO MAKING ADJUSTMENTS BASED ON THEORETICAL**
24 **RESERVE IMBALANCES?**

1 A. Yes. The National Association of Regulatory Utility Commissioners observes the
2 following on page 189 of the textbook *Public Utility Depreciation Practices*:

3 When a depreciation reserve imbalance exists, one should investigate
4 why past depreciation rates, average service lives, salvage, or cost of
5 removal amounts differ from the current estimates. Care should be
6 taken to analyze these effects before correcting for the reserve
7 imbalances. Instances occur where subsequent experience shows the
8 original estimates no longer to be appropriate. It should be noted that
9 only after plant has lived its entire useful life will the true depreciation
10 parameters become known.

11 Mr. Andrews does not appear to have investigated why reserve imbalances exist for
12 these accounts. As I will discuss, a better understanding of the background of many
13 of the Company's power plants demonstrates that Mr. Andrews' proposal to reallocate
14 book reserves is not appropriate.

15 **Q. ARE ANY RESERVE IMBALANCES ADDRESSED IN THE COMPANY'S**
16 **DEPRECIATION STUDY?**

17 A. Yes. As discussed previously in my testimony, the remaining life technique was used
18 in the depreciation study. The remaining life technique addresses any reserve
19 imbalances and remaining life depreciation rates are calculated to ensure the full
20 recovery of the service value of the Company's assets, no more and no less.

21 **Q. WHAT ARE THE FUNCTIONS OR PLANTS THAT MR. ANDREWS**
22 **REFERS TO AS "OVER-ACCRUED?"**

23 A. The two primary areas Mr. Andrews identifies and appears to target his adjustments
24 are the Labadie and Rush Island coal-fired power plants and the Other Production
25 function.

26 **Q. ARE THERE REASONS TO EXPECT THAT FUTURE EXPERIENCE WILL**
27 **SHOW THE THEORETICAL RESERVE POSITION FOR LABADIE AND**

1 **RUSH ISLAND TO BE DIFFERENT FROM THE INDICATIONS IN THE**
2 **CURRENT STUDY?**

3 A. Yes. As I discussed on page 10 of my direct testimony, the actual life spans for Ameren
4 Missouri's coal-fired facilities could end up being shorter than used in the depreciation
5 study, which are the same as those used in the previous study. Indeed, many coal-fired
6 facilities across the country have been retired at younger ages than the life spans
7 estimated for Labadie and Rush Island (which are in the 68 to 72-year range). If shorter
8 life spans were used for Labadie and Rush Island, the theoretical reserve would be
9 higher and may even exceed the book reserve. Thus, the perceived "over-accrued"
10 position alleged by Mr. Andrews may prove to be illusory.

11 Additionally, the net salvage estimates for steam production facilities do not include
12 any costs associated with decommissioning the facilities once they reach the end of
13 their lives or remediating ash ponds. These are costs that the Company will need to
14 incur, as evidenced by the experience of many coal plants across the country including
15 the Company's Venice plant. If these costs were included in the net salvage estimates,
16 it would also increase the theoretical reserve and reduce the theoretical "imbalance"
17 to which Mr. Andrews points.⁴

18 **Q. GIVEN THESE CONSIDERATIONS, DO YOU AGREE WITH MR.**
19 **ANDREWS THAT A REALLOCATION OF THE BOOK RESERVE IS**
20 **APPROPRIATE FOR STEAM PRODUCTION PLANT?**

⁴ I note that in other cases Mr. Andrews has not disagreed with the concept that terminal net salvage costs should be included in depreciation rates (although he may not have agreed with a company's cost estimates). For example, in a recent case for Duke Indiana, Mr. Andrews' included tens of millions of dollars of terminal net salvage costs for steam production plants (see page 46 of Mr. Andrews' testimony in Indiana Cause No. 45253). I have attached the relevant excerpt from Mr. Andrew's testimony in that case as Schedule JJS-R2.

1 A. No. Given the possibility that Labadie and Rush Island will be retired earlier than
2 reflected in the theoretical reserve calculations he has used as well as the potential for
3 significant net salvage costs that are also not included in the theoretical reserve
4 calculations, I do not believe a reallocation of the reserve for steam plants is
5 appropriate. If Mr. Andrews' proposal was adopted, it is likely that in future
6 depreciation studies Labadie and Rush Island could be in significant "under-accrued"
7 positions. Further, his proposal would increase the risk that the costs for these plants
8 – including net salvage costs – will not be recovered by the time they are retired, which
9 would result in intergenerational inequity.

10 **Q. ARE THERE ANY SPECIFIC CONSIDERATIONS FOR OTHER**
11 **PRODUCTION PLANT?**

12 A. Yes. Mr. Andrews alleges that "Ameren Missouri's investment in Other Production
13 (mostly combustion turbines) is overstated by \$207 million, or 44%. This is because
14 FERC Account 344 is significantly over-accrued."⁵ First, as discussed above, a
15 positive theoretical reserve imbalance does not mean that the reserve is "over-
16 accrued," but instead simply means that the book reserve is larger than a theoretical
17 number. Further, Mr. Andrews' testimony provides no evidence that he has
18 investigated or considered why the book reserve for Account 344 is higher than the
19 theoretical reserve. This information should be considered when assessing whether to
20 make any reserve adjustments and, for Ameren Missouri, supports making no
21 adjustment from Other Production to other plant functions.

⁵ Andrews at 9:9-11.

1 **Q. WHAT HAS CAUSED THE THEORETICAL RESERVE IMBALANCE FOR**
2 **OTHER PRODUCTION FACILITIES?**

3 A. The reserve imbalance for Other Production is primarily due to five combustion
4 turbines that the Company purchased in 2005 and 2006. These plants are Audrain,
5 Goose Creek, Kinmundy, Pickneyville, and Raccoon Creek. These five plants
6 comprise approximately \$492 million, or 73%, of the accumulated depreciation for
7 Other Production plant accounts. Kinmundy and Pickneyville were acquired from an
8 Ameren affiliate company at their net book value at the time.⁶ Audrain was purchased
9 from NRG Energy, Inc. which was in bankruptcy at the time of the sale. Goose Creek
10 and Raccoon Creek were purchased from Aquila in what the Commission found were
11 "similar circumstances." The Commission has found that the sales of Audrain, Goose
12 Creek, and Raccoon Creek were "essentially a forced sale."⁷
13 Approximately \$371 million, or 55%, of the total Other Production book reserve, is
14 due to Audrain, Goose Creek, and Raccoon Creek. These plants were acquired for less
15 than their net book value. Because these assets were impaired when purchased, the
16 accounting for the difference between the net book value and purchase price for these
17 assets resulted in an increase to accumulated depreciation so that the resultant net book
18 value was equal to the purchase price. This resulted in the book reserve being fairly
19 high for these assets – for Audrain the book reserve is approximately 56% of the
20 original cost and for Goose Creek, and Raccoon Creek the book reserve is
21 approximately 75% of the original cost.

⁶ See page 60 of the Order in Case No. ER-2007-0002.

⁷ See page 62 of the Order in Case No. ER-2007-0002.

1 An understanding of this history reveals that these plants, which comprise \$168
2 million of the overall \$207 million theoretical reserve imbalance calculated by Mr.
3 Andrews, are not "over-accrued" but rather their accumulated depreciation balances
4 are in large part the result of impairments incurred by previous owners or depreciation
5 expense incurred by previous owners.

6 **Q. GIVEN THIS BACKGROUND, DO YOU BELIEVE THAT MR. ANDREWS'**
7 **PROPOSED ADJUSTMENTS ARE APPROPRIATE?**

8 A. No. It is more appropriate to use the remaining life technique to allocate the
9 unrecovered costs for these plants over their remaining lives. This approach will
10 allocate the costs of these plants over the time they are in service. In contrast, Mr.
11 Andrews' proposal will transfer reserves for these plants to other functions and result
12 in a mismatch of the recovery of these costs.

13 **Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?**

14 A. Yes.

**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 Decrease Its Revenues for) File No. ER-2019-0335
 Electric Service.)

AFFIDAVIT OF JOHN J. SPANOS

COMMONWEALTH OF PENNSYLVANIA)
)**ss**
COUNTY OF CUMBERLAND)

COMES NOW John J. Spanos, and on his oath declares that he is of sound mind and lawful age; that he has prepared the foregoing *Rebuttal Testimony*; and that the same is true and correct according to his best knowledge and belief.

Further the Affiant sayeth not.

John J. Spanos

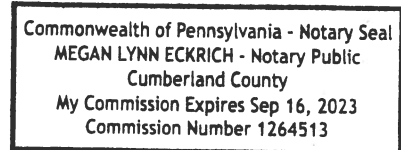
 John J. Spanos

Subscribed and sworn to before me this 20th day of January, 2020.

Megan Lynn Eckrich

 Notary Public

My commission expires: September 16, 2023



AMEREN MISSOURI

ELECTRIC DIVISION

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

DEPRECIABLE GROUP (1)	PROBABLE RETIREMENT YEAR	SURVIVOR CURVE (3)	NET SALVAGE PERCENT (4)	ORIGINAL COST AS OF DECEMBER 31, 2018 (5)	BOOK DEPRECIATION RESERVE (6)	FUTURE ACCRUALS (7)	CALCULATED ANNUAL ACCRUAL AMOUNT (8)	RATE (9)=(8)/(5)	COMPOSITE REMAINING LIFE (10)=(7)/(8)	
	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)=(8)/(5)	(10)=(7)/(8)	
OTHER PRODUCTION PLANT										
<i>VENICE COMBUSTION TURBINE PRODUCTION PLANT</i>										
341.00										
	12-2042	40-R3	*	(5)	13,604,827.36	4,826,138	9,458,931	451,380	3.32	21.0
342.00	12-2042	45-R3	*	(5)	4,157,867.16	1,159,504	3,206,257	146,815	3.53	21.8
344.00	12-2042	45-R4	*	(5)	169,405,038.55	56,717,198	121,158,092	5,336,674	3.15	22.7
345.00	12-2042	40-R2.5	*	(5)	16,699,384.12	4,801,601	12,732,752	614,615	3.68	20.7
346.00	12-2042	22-L2.5	*	0	399,276.90	150,406	248,871	20,742	5.19	12.0
346.21		20-SQ		0	21,700.49	12,649	9,051	1,561	7.19	5.8
346.22		15-SQ		0	87,560.97	44,256	43,305	6,679	7.63	6.5
346.23		5-SQ		0	33,880.86	13,096	20,785	7,088	20.92	2.9
<i>TOTAL VENICE COMBUSTION TURBINE PRODUCTION PLANT</i>					<i>204,409,536.41</i>	<i>67,724,848</i>	<i>146,878,044</i>	<i>6,585,554</i>	<i>3.22</i>	
<i>MERAMEC COMBUSTION TURBINE PRODUCTION PLANT</i>										
341.00	12-2028	40-R3	*	(5)	1,481,247.23	528,740	1,026,570	110,556	7.46	9.3
342.00	12-2028	45-R3	*	(5)	1,292,315.85	759,646	597,286	63,999	4.95	9.3
344.00	12-2028	45-R4	*	(5)	19,641,084.66	14,986,472	5,636,667	598,370	3.05	9.4
345.00	12-2028	40-R2.5	*	(5)	2,591,296.67	1,634,993	1,085,869	120,119	4.64	9.0
346.00	12-2028	22-L2.5	*	0	12,535.13	12,535	0	0	-	-
<i>TOTAL MERAMEC COMBUSTION TURBINE PRODUCTION PLANT</i>					<i>25,018,479.54</i>	<i>17,922,386</i>	<i>8,346,392</i>	<i>893,044</i>	<i>3.57</i>	
<i>FAIRGROUNDS COMBUSTION TURBINE PRODUCTION PLANT</i>										
341.00	12-2028	40-R3	*	(5)	446,939.60	211,077	258,210	28,774	6.44	9.0
342.00	12-2028	45-R3	*	(5)	514,944.57	316,002	224,690	23,961	4.65	9.4
344.00	12-2028	45-R4	*	(5)	4,808,264.63	5,048,678	0	0	-	-
345.00	12-2028	40-R2.5	*	(5)	531,581.02	558,160	0	0	-	-
346.00	12-2028	22-L2.5	*	0	3,290.93	1,593	1,698	197	5.99	8.6
<i>TOTAL FAIRGROUNDS COMBUSTION TURBINE PRODUCTION PLANT</i>					<i>6,305,020.75</i>	<i>6,135,510</i>	<i>484,598</i>	<i>52,932</i>	<i>0.84</i>	
<i>MOREAU COMBUSTION TURBINE PRODUCTION PLANT</i>										
341.00	12-2028	40-R3	*	(5)	297,198.03	165,495	146,563	16,494	5.55	8.9
342.00	12-2028	45-R3	*	(5)	460,502.85	306,016	177,512	18,917	4.11	9.4
344.00	12-2028	45-R4	*	(5)	6,099,517.80	6,404,494	0	0	-	-
345.00	12-2028	40-R2.5	*	(5)	738,193.81	775,104	0	0	-	-
346.00	12-2028	22-L2.5	*	0	11,064.09	11,064	0	0	-	-
<i>TOTAL MOREAU COMBUSTION TURBINE PRODUCTION PLANT</i>					<i>7,606,476.58</i>	<i>7,662,173</i>	<i>324,075</i>	<i>35,411</i>	<i>0.47</i>	
<i>MOBERLY COMBUSTION TURBINE PRODUCTION PLANT</i>										
341.00	12-2028	40-R3	*	(5)	325,075.09	208,027	133,302	15,228	4.68	8.8
342.00	12-2028	45-R3	*	(5)	445,022.74	283,855	183,419	19,660	4.42	9.3
344.00	12-2028	45-R4	*	(5)	6,080,808.79	6,384,849	0	0	-	-
345.00	12-2028	40-R2.5	*	(5)	721,042.04	757,094	0	0	-	-
346.00	12-2028	22-L2.5	*	0	8,819.99	8,820	0	0	-	-
<i>TOTAL MOBERLY COMBUSTION TURBINE PRODUCTION PLANT</i>					<i>7,580,768.65</i>	<i>7,642,645</i>	<i>316,721</i>	<i>34,888</i>	<i>0.46</i>	

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DEPRECIABLE GROUP (1)	PROBABLE	SURVIVOR	NET	ORIGINAL COST	BOOK	FUTURE	CALCULATED		COMPOSITE	
	RETIREMENT						CURVE	SALVAGE		AS OF
	YEAR	(3)	PERCENT	DECEMBER 31, 2018	RESERVE	ACCURUALS	AMOUNT	(9)=(8)/(5)	LIFE	
	(2)		(4)	(5)	(6)	(7)	(8)		(10)=(7)/(8)	
<i>MEXICO COMBUSTION TURBINE PRODUCTION PLANT</i>										
341.00	12-2028	40-R3	*	(5)	272,385.24	149,406	136,599	15,309	5.62	8.9
342.00	12-2028	45-R3	*	(5)	379,992.42	256,441	142,551	15,237	4.01	9.4
344.00	12-2028	45-R4	*	(5)	6,149,051.29	6,456,504	0	0	-	-
345.00	12-2028	40-R2.5	*	(5)	753,491.35	791,166	0	0	-	-
346.00	12-2028	22-L2.5	*	0	16,209.12	16,209	0	0	-	-
346.22		15-SQ		0	13,164.54	6,949	6,216	956	7.26	6.5
<i>TOTAL MEXICO COMBUSTION TURBINE PRODUCTION PLANT</i>					7,584,293.96	7,676,675	285,366	31,502	0.42	
<i>PENO CREEK COMBUSTION TURBINE PRODUCTION PLANT</i>										
341.00	12-2042	40-R3	*	(5)	2,317,152.63	783,793	1,649,217	78,743	3.40	20.9
342.00	12-2042	45-R3	*	(5)	4,639,446.21	1,948,674	2,922,745	135,045	2.91	21.6
344.00	12-2042	45-R4	*	(5)	92,120,377.16	37,711,140	59,015,256	2,650,786	2.88	22.3
345.00	12-2042	40-R2.5	*	(5)	11,458,957.46	6,081,948	5,949,957	294,110	2.57	20.2
346.00	12-2042	22-L2.5	*	0	1,554,511.44	963,518	590,993	59,606	3.83	9.9
346.21		20-SQ		0	187,266.52	149,968	37,299	10,657	5.69	3.5
346.22		15-SQ		0	88,374.06	46,467	41,907	6,609	7.48	6.3
346.23		5-SQ		0	21,060.12	8,317	12,743	4,496	21.35	2.8
<i>TOTAL PENO CREEK COMBUSTION TURBINE PRODUCTION PLANT</i>					112,387,145.60	47,693,825	70,220,117	3,240,052	2.88	
<i>AUDRAIN COMBUSTION TURBINE PRODUCTION PLANT</i>										
341.00	12-2041	40-R3	*	(5)	3,101,234.89	1,123,637	2,132,660	108,047	3.48	19.7
342.00	12-2041	45-R3	*	(5)	5,035,453.62	2,364,218	2,923,008	141,754	2.82	20.6
344.00	12-2041	45-R4	*	(5)	137,875,494.18	88,768,545	56,000,724	2,648,009	1.92	21.1
345.00	12-2041	40-R2.5	*	(5)	27,878,525.14	7,070,593	22,201,858	1,135,799	4.07	19.5
346.00	12-2041	22-L2.5	*	0	1,641,353.12	541,643	1,099,710	64,968	3.96	16.9
346.21		20-SQ		0	1,231.20	1,035	196	78	6.34	2.5
346.22		15-SQ		0	34,054.59	13,020	21,035	2,450	7.19	8.6
346.23		5-SQ		0	20,610.26	9,508	11,102	3,920	19.02	2.8
<i>TOTAL AUDRAIN COMBUSTION TURBINE PRODUCTION PLANT</i>					175,587,957.00	99,892,199	84,390,293	4,105,025	2.34	
<i>GOOSE CREEK COMBUSTION TURBINE PRODUCTION PLANT</i>										
341.00	12-2043	40-R3	*	(5)	3,735,844.64	2,684,724	1,237,913	57,748	1.55	21.4
342.00	12-2043	45-R3	*	(5)	2,830,086.41	2,125,947	845,644	37,702	1.33	22.4
344.00	12-2043	45-R4	*	(5)	185,416,079.11	140,131,293	54,555,590	2,363,124	1.27	23.1
345.00	12-2043	40-R2.5	*	(5)	20,690,348.00	15,591,057	6,133,808	289,675	1.40	21.2
346.00	12-2043	22-L2.5	*	0	888,104.72	749,148	138,957	11,463	1.29	12.1
346.21		20-SQ		0	6,212.83	4,603	1,610	358	5.76	4.5
346.22		15-SQ		0	34,083.03	17,446	16,637	2,463	7.23	6.8
346.23		5-SQ		0	20,182.15	9,428	10,754	3,823	18.94	2.8
<i>TOTAL GOOSE CREEK COMBUSTION TURBINE PRODUCTION PLANT</i>					213,620,940.89	161,313,646	62,940,913	2,766,356	1.29	

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DEPRECIABLE GROUP (1)	PROBABLE	SURVIVOR	NET	ORIGINAL COST	BOOK	FUTURE	CALCULATED		COMPOSITE	
	RETIREMENT						CURVE	SALVAGE		AS OF
	YEAR	(3)	PERCENT	DECEMBER 31, 2018	RESERVE	(7)	AMOUNT	(9)=(8)/(5)	(10)=(7)/(8)	
	(2)		(4)	(5)	(6)		(8)			
<i>KINMUNDY COMBUSTION TURBINE PRODUCTION PLANT</i>										
341.00	12-2041	40-R3	*	(5)	2,708,695.91	854,903	1,989,228	102,053	3.77	19.5
342.00	12-2041	45-R3	*	(5)	5,678,413.86	2,077,027	3,885,308	188,761	3.32	20.6
344.00	12-2041	45-R4	*	(5)	87,987,174.20	42,437,759	49,948,774	2,362,235	2.68	21.1
345.00	12-2041	40-R2.5	*	(5)	6,452,462.92	2,597,644	4,177,442	216,341	3.35	19.3
346.00	12-2041	22-L2.5	*	0	251,222.92	85,459	165,764	15,791	6.29	10.5
346.21		20-SQ	0	0	5,660.72	4,760	901	360	6.36	2.5
346.22		15-SQ	0	0	78,576.54	58,813	19,764	5,950	7.57	3.3
346.23		5-SQ	0	0	20,520.57	9,440	11,081	3,896	18.99	2.8
<i>TOTAL KINMUNDY COMBUSTION TURBINE PRODUCTION PLANT</i>					103,182,727.64	48,125,805	60,198,262	2,895,387	2.81	
<i>PICKNEYVILLE COMBUSTION TURBINE PRODUCTION PLANT</i>										
341.00	12-2040	40-R3	*	(5)	9,381,260.12	4,759,296	5,091,027	268,986	2.87	18.9
342.00	12-2040	45-R3	*	(5)	5,032,240.86	2,377,204	2,906,649	146,432	2.91	19.8
344.00	12-2040	45-R4	*	(5)	146,378,640.55	61,922,248	91,775,325	4,507,813	3.08	20.4
345.00	12-2040	40-R2.5	*	(5)	13,201,455.23	6,091,099	7,770,429	409,357	3.10	19.0
346.00	12-2040	22-L2.5	*	0	565,619.59	327,935	237,685	21,423	3.79	11.1
346.21		20-SQ	0	0	1,298.67	1,170	129	86	6.62	1.5
346.22		15-SQ	0	0	60,437.66	36,152	24,286	4,673	7.73	5.2
346.23		5-SQ	0	0	22,684.13	10,138	12,546	4,353	19.19	2.9
<i>TOTAL PICKNEYVILLE COMBUSTION TURBINE PRODUCTION PLANT</i>					174,643,636.81	75,525,242	107,818,076	5,363,123	3.07	
<i>RACCOON COMBUSTION TURBINE PRODUCTION PLANT</i>										
341.00	12-2042	40-R3	*	(5)	2,322,926.81	1,558,819	880,254	42,145	1.81	20.9
342.00	12-2042	45-R3	*	(5)	3,331,915.94	2,382,861	1,115,651	51,433	1.54	21.7
344.00	12-2042	45-R4	*	(5)	126,108,759.59	96,448,736	35,965,462	1,626,804	1.29	22.1
345.00	12-2042	40-R2.5	*	(5)	17,818,901.67	13,111,202	5,598,645	274,434	1.54	20.4
346.00	12-2042	22-L2.5	*	0	1,248,626.53	772,098	476,529	33,138	2.65	14.4
346.21		20-SQ	0	0	6,077.34	4,867	1,210	346	5.69	3.5
346.22		15-SQ	0	0	36,049.99	14,949	21,101	2,569	7.13	8.2
346.23		5-SQ	0	0	19,269.10	9,261	10,008	3,617	18.77	2.8
<i>TOTAL RACCOON COMBUSTION TURBINE PRODUCTION PLANT</i>					150,892,526.97	114,302,793	44,068,860	2,034,486	1.35	
<i>MARYLAND HEIGHTS PRODUCTION PLANT</i>										
341.00	12-2052	40-R3	*	(5)	6,510,843.22	961,197	5,875,188	198,755	3.05	29.6
342.00	12-2052	45-R3	*	(5)	14,870,622.51	1,813,109	13,801,045	444,987	2.99	31.0
344.00										
344.00	12-2052	45-R4	*	(5)	12,281,459.24	1,211,244	11,684,288	360,616	2.94	32.4
344.00	12-2052	8-S2.5	*	40	8,417,407.92	2,269,640	2,780,805	835,747	9.93	3.3
345.00	12-2052	40-R2.5	*	(5)	6,743,189.67	1,345,610	5,734,739	197,954	2.94	29.0
346.00	12-2052	22-L2.5	*	0	1,251,827.94	469,715	782,113	48,765	3.90	16.0
346.21		20-SQ	0	0	49,252.25	11,354	37,898	2,807	5.70	13.5
346.22		15-SQ	0	0	32,477.66	8,741	23,737	2,736	8.42	8.7
346.23		5-SQ	0	0	15,814.59	(40,143)	55,958	21,910	138.54	2.6
<i>TOTAL MARYLAND HEIGHTS PRODUCTION PLANT</i>					50,172,895.00	8,050,467	40,775,771	2,114,277	4.21	

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DEPRECIABLE GROUP (1)	PROBABLE RETIREMENT YEAR	SURVIVOR CURVE	NET SALVAGE PERCENT	ORIGINAL COST AS OF DECEMBER 31, 2018	BOOK DEPRECIATION RESERVE	FUTURE ACCRUALS	CALCULATED ANNUAL ACCRUAL		COMPOSITE REMAINING LIFE		
	(2)	(3)	(4)	(5)	(6)	(7)	AMOUNT (8)	RATE (9)=(8)/(5)	(10)=(7)/(8)		
<i>O'FALLON SOLAR PRODUCTION PLANT</i>											
341.00	STRUCTURES AND IMPROVEMENTS	12-2034	20-S2.5	*	0	2,858,821.95	224,017	2,634,805	195,171	6.83	13.5
344.00	GENERATORS	12-2034	20-S2.5	*	0	9,375,593.50	2,231,817	7,143,776	529,169	5.64	13.5
345.00	ACCESSORY ELECTRIC EQUIPMENT	12-2034	20-S2.5	*	0	3,920,601.80	401,852	3,518,750	260,648	6.65	13.5
346.00	MISCELLANEOUS POWER PLANT EQUIPMENT	12-2034	20-S2.5	*	0	11,593.88	2,993	8,601	637	5.49	13.5
346.23	MISCELLANEOUS POWER PLANT EQUIPMENT - COMPUTERS		5-SQ		0	24,536.46	16,138	8,398	8,398	34.23	1.0
<i>TOTAL O'FALLON SOLAR PRODUCTION PLANT</i>						<u>16,191,147.59</u>	<u>2,876,817</u>	<u>13,314,330</u>	<u>994,023</u>	<u>6.14</u>	
<i>OTHER RENEWABLES PRODUCTION PLANT</i>											
344.00	GENERATORS		20-S2.5	*	0	1,305,325.88	552,944	752,382	64,087	4.91	11.7
345.00	ACCESSORY ELECTRIC EQUIPMENT		20-S2.5	*	0	68,382.87	9,161	59,222	5,044	7.38	11.7
<i>TOTAL OTHER RENEWABLES PRODUCTION PLANT</i>						<u>1,373,708.75</u>	<u>562,105</u>	<u>811,604</u>	<u>69,131</u>	<u>5.03</u>	
TOTAL DEPRECIABLE OTHER PRODUCTION PLANT						<u>1,256,557,262.14</u>	<u>673,107,136</u>	<u>641,173,422</u>	<u>31,215,191</u>	<u>2.48</u>	
ACCOUNTS NOT STUDIED											
340.00	LAND AND LAND RIGHTS					<u>6,912,475.61</u>					
TOTAL ACCOUNTS NOT STUDIED						<u>6,912,475.61</u>					
TOTAL OTHER PRODUCTION PLANT						<u>1,263,469,737.75</u>			<u>31,215,191</u>	<u>2.47</u>	

* CURVE SHOWN IS INTERIM SURVIVOR CURVE.

TABLE 9
Terminal Net Salvage Comparison

Plant	IG		Duke		Delta	
	Terminal Net Salvage Cost (000)	Terminal Net Salvage Rates	Terminal Net Salvage Cost ¹ (000)	Terminal Net Salvage Rates ²	Terminal Net Salvage Cost (000)	Terminal Net Salvage Rates
Cayuga	\$ 51,663	(5)	\$ 80,640	(7)	\$ (28,978)	2
Edwardsport	36,304	(4)	313,736	(15)	(277,432)	11
Gallagher	26,796	(10)	41,427	(15)	(14,631)	5
Gibson	94,534	(6)	215,672	(9)	(121,138)	3
Markland	8,974	(16)	14,166	(23)	(5,192)	7
Cayuga CT	1,079	(3)	1,818	(5)	(739)	2
Henry County	1,389	(4)	3,265	(6)	(1,876)	2
Madison	958	(3)	12,014	(6)	(11,056)	3
Noblesville CT	6,175	(4)	23,786	(11)	(17,611)	7
Vermillion	1,727	(4)	8,728	(9)	(7,001)	5
Wheatland	1,154	(4)	15,869	(17)	(14,715)	13
Crane	3,241	(8)	4,726	(12)	(1,485)	4
Total:	\$ 233,992		\$ 736,846		\$ (501,853)	

Source: (1) Data Response IG Attachment 14.14-A
(2) 45253-DEI-Petitioner's Workpaper 2-JSS

1 As is shown in Table 9 above, my recommended level of decommissioning
2 costs for inclusion in the terminal net salvage calculations is \$234 million, compared to
3 \$736 million proposed by Duke. This is a reduction of over \$500 million to future
4 depreciation accruals due to the unsupported and excessive inventory, contingency,
5 and inflation assumptions proposed by Duke. The reduction of decommissioning costs
6 results in the lower (less negative) net salvage rates presented above. My calculations
7 of terminal net salvage rates and average net salvage rates are presented in
8 Attachment BCA-14.

9 Q HAVE YOU UPDATED DUKE'S PROPOSED ELG DEPRECIATION RATES WITH
10 YOUR RECOMMENDED TERMINAL NET SALVAGE RATES?

11 A Yes. I present a set of depreciation rates using the ELG procedure and with my
12 proposed net salvage rates in my Attachment BCA-15.