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**MISSOURI PUBLIC SERVICE COMMISSION
Case No. EA-2014-0207**

CROSS-SURREBUTTAL TESTIMONY

OF

MICHAEL S. PROCTOR

ON BEHALF OF

SHOW-ME CONCERNED LAND OWNERS

October 14, 2014

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1 **Q. ARE YOU THE SAME MICHAEL S. PROCTOR WHO HAS PREVIOUSLY FILED**
2 **REBUTTAL TESTIMONY IN THIS CASE?**

3 A. Yes, I am.

4 **I. OVERVIEW**

5 **Q. WHAT IS THE PURPOSE OF YOUR CROSS-SURREBUTTAL TESTIMONY?**

6 A. My cross-surrebuttal testimony will respond to and comment on the rebuttal testimonies
7 submitted on behalf of the Missouri Public Service Commission Staff (Staff) by Mr. Daniel I.
8 Beck and Ms. Sarah L. Kliethermes.

9 **Q. WHAT IS YOUR SUMMARY OF THE TESTIMONIES OF THESE STAFF**
10 **WITNESSES?**

11 A. In summary, both witnesses have set out additional requirements that Grain Belt Express
12 must meet in order to satisfy the Missouri Commission's (Commission's) filing requirements
13 and five criteria for issuing a Certificate of Convenience and Necessity (CNN), commonly
14 referred to as the "Tartan" criteria. My cross-surrebuttal testimony will focus on two of the
15 five criteria: #1) there must be a need for the service; and #4) the applicant's proposal must
16 be economically feasible.

17 In brief, my cross-surrebuttal is that while the Staff's additional requirements partially
18 capture the deficiencies in the Grain Belt Express' filing, those additional requirements fall
19 short of what should have been provided to the Commission in order to meet the "Tartan"
20 criteria and be granted a CNN. Specifically, the Staff did not address the importance of the
21 levelized cost analysis submitted by the Applicant and relate that analysis to the rate impact
22 condition of the Missouri RES and the Commission's rule for renewable energy.

1 **Q. DO YOU AGREE WITH THE STAFF’S OVERALL RECOMMENDATION TO THE**
2 **COMMISSION?**

3 A. I do not agree with a recommendation that if an Applicant for a CNN has not met the
4 “Tartan” criteria that the Commission then approves their application subject to their
5 providing studies and information needed to show whether or not they can meet those
6 criteria. Instead, the Commission should issue an order rejecting the application because
7 Grain Belt Express has not provided evidence that their proposal meets a need and is
8 economically feasible.

9 **II. NEED FOR THE SERVICE – CROSS-SURREBUTTAL TO DANIEL BECK**
10 **REBUTTAL TESTIMONY**

11 **A. RENEWABLE ENERGY NEED**

12 **Q. DID MR. BECK ADDRESS THE NEED FOR THE PROPOSED GRAIN BELT**
13 **EXPRESS PROJECT?**

14 A, Yes, he did. At line 13 on page 8, Mr. Beck states that that “the need is based on the
15 Missouri’s Renewable Energy Standard (“RES”).” While other needs are also addressed in
16 the Grain Belt Express application, Mr. Beck properly focuses on the above need as the only
17 one in the application as being related to Missouri.

18 **Q. DID MR. BECK AGREE WITH THE APPLICANT THAT THE RENEWABLE**
19 **ENERGY FROM ITS PROPOSED KANSAS WIND + DC TRANSMISSION**
20 **PROJECT IS NEEDED TO MEET MISSOURI’S RES?**

21 A. No, he did not. In fact, Mr. Beck points out in lines 1-4 on page 9 that: “it ignores the fact
22 that the investor-owned utilities can meet the RES using renewable energy credits (‘RECs’).

1 and those RECs do not have to be associated with energy that is delivered to or generated in
2 Missouri.”

3 **Q. WHY ARE MR. BECK’S OBSERVATIONS ABOUT RECS IMPORTANT TO THE**
4 **DISCUSSION OF NEED?**

5 A. Mr. Beck’s observation that RECs need not be associated with energy from wind physically
6 delivered or generated into Missouri basically means that the energy from Kansas Wind
7 physically delivered via a DC transmission line to a converter station located in Missouri is
8 not needed to meet Missouri’s RES. Moreover, the Missouri RES allows utilities to purchase
9 RECs without having to purchase the energy from the wind farms producing that energy. A
10 wind farm can sell the energy into regional wholesale markets, and then sell the RECs into a
11 separate market at a much lower costs than what it costs to purchase the energy and have it
12 delivered to Missouri. Thus, it appears that not only is the Grain Belt Express project not
13 needed to meet the Missouri RES, but is not the most economical way of meeting the
14 renewable energy requirement.

15 **Q. DOES HAVING AN ALTERNATIVE TO WHAT AN APPLICANT IS PROPOSING**
16 **MEAN THAT THE APPLICANT’S PROPOSAL IS NOT MEETING A NEED?**

17 A. No, “not required to meet a need” because of an alternative is not that same as there “not
18 being a need for the service.” In regulated utility practice, alternatives for meeting a known
19 need are compared, and the least-cost alternative is considered to be the best choice. In
20 business practice, several alternatives can meet a need, but those businesses that meet that
21 need at the lowest price are the ones that succeed. It follows that the physical ability to meet
22 a known need is a necessary, but not a sufficient condition for granting a CNN.

23 **B. RETAIL RATE INCREASE LIMIT**

1 **Q. ARE THERE ADDITIONAL CRITERIA IN THE MISSOURI STATUTES THAT MR.**
2 **BECK FAILED TO DISCUSS IN HIS REBUTTAL TESTIMONY?**

3 A. Missouri statutes at 393.1050 states: "*Any renewable mandate required by law shall not raise*
4 *rates charged to the customers of electric retail suppliers by an average of more than one*
5 *percent in any year*" Mr. Beck's rebuttal testimony points out other aspects of the
6 Missouri statutes, but failed to discuss the implications of this very critical criterion.

7 **Q. WHY IS THIS LIMIT OF A ONE PERCENT RATE INCREASE CRITICAL TO THE**
8 **QUESTION OF MEETING THE NEED FOR RENEWABLE ENERGY IN**
9 **MISSOURI?**

10 A. In order for the Grain Belt Express to show its proposal meets the requirements of the
11 Missouri RES as a possible alternative, it must show that the addition of the costs of Kansas
12 Wind + DC Transmission will not increase Missouri retail rates for Ameren Missouri by an
13 average of more than one percent in any year.

14 **Q. WHAT DO THE COMMISSION'S RULES FOR IMPLEMENTING THE MISSOURI**
15 **RES SAY ABOUT THIS ONE PERCENT RETAIL RATE IMPACT LIMIT?**

16 A. The Missouri Commission's rules for implementing the Missouri RES (40 CSR 240-
17 20)(5)(b) state: "*The RES retail rate impact shall be determined by subtracting the total*
18 *retail revenue requirement incorporating an incremental non-renewable generation and*
19 *purchased power portfolio from the total retail revenue requirement including an*
20 *incremental RES-compliant generation and purchased power portfolio.*" It appears the
21 Applicant's approach to showing it will meet this requirement was to show the levelized cost
22 of its project is lower than the levelized costs of other generation alternatives. While my
23 rebuttal testimony shows that the applicant's claim of its proposal being the least-cost

1 alternative is not true, the Staff's rebuttal testimony did not address the Applicant's levelized
2 cost study as providing evidence for having met the retail rate impact limit.

3 **Q. CAN THE APPLICANT MEET OTHER NEEDS IN MISSOURI NOT DISCUSSED**
4 **IN MR. BECK'S REBUTTAL TESTIMONY?**

5 A. This project can meet the need for energy and capacity required from future load growth and
6 retirements of existing generation facilities. While Mr. Beck's rebuttal testimony focused
7 primarily on the applicant's claim of meeting Missouri RES as a need, the rebuttal testimony
8 of Ms. Sarah L. Kliethermes addresses the further question of economic feasibility that is
9 related to meeting Ameren Missouri's need for capacity and energy.

10 **III. ECONOMIC FEASIBILITY – CROSS SURREBUTAL TO SARAH KLIETHERMES**
11 **REBUTTAL TESTIMONY**

12 **Q. HOW DID STAFF ADDRESS THE OVERALL QUESTION OF THE RELATIVE**
13 **COST OF THE APPLICANT'S PROPOSAL?**

14 A. Ms. Kliethermes addressed the Applicant's claim that its proposed project would lower retail
15 rates in Missouri.

16 **Q. IN YOUR OPINION, DOES THE APPLICANT'S PROPOSED PROJECT HAVE TO**
17 **LOWER MISSOURI RETAIL RATES TO EITHER MEET THE CRITERIA FOR**
18 **NEED OR ECONOMIC FEASIBILITY?**

19 A. While lowering Missouri retail rates is a sufficient condition for meeting the retail rate
20 impact limit, it is not necessary. Let me illustrate the point using the levelized costs from my
21 rebuttal testimony and reasonable assumptions about the next several years for load growth
22 and the cost of Ameren Missouri's existing system.

1 The following table assumes that existing load is in the range of 87.4% of Ameren
 2 Missouri's total load for the next several years and that the levelized cost for this existing
 3 system is 6 ¢/kWh or \$60/MWh. It takes a 2% load growth per year to produce an average of
 4 12.6% in new load over a 10-11 year period. The average level for retail rates depends on
 5 many factors, including retirements of existing generation assets. Assuming a starting
 6 average embedded cost of \$70/MWh with \$35 from return on and of capital and \$35 from
 7 expenses, if the capital assets are depreciated and retired at an average rate of 6.67% per
 8 year, then the levelized cost of the existing system over the next 10-11 year period will be
 9 \$60/MWh. This table also assumes that both the load growth and the retirements of
 10 generation assets produce a need for new energy and capacity, and compares adding
 11 Combined Cycle generation at a levelized cost of \$86/MWh to adding Wind generation at a
 12 levelized cost of \$91/MWh. With both alternatives, retail rates will increase. But with the
 13 Wind alternative being higher, rates go up \$0.63/MWh or by 1% more than with the
 14 Combined Cycle alternative.

	% Energy	Adding CC	Adding Wind
	% MWh	\$/MWh	\$/MWh
Embedded	87.40%	\$60.00	\$60.00
New	12.60%	\$86.00	\$91.00
Average	100.00%	\$63.28	\$63.91
Difference (Wind - CC)		\$0.63	
% Increase (Diff / CC)		1.00%	

15
 16 Assuming the above represents the levelized costs over the 10 years after the wind
 17 resources are added, then the Wind would meet the need for the Missouri RES, but because it
 18 is not the lowest cost alternative, it would not meet the need for economically feasible energy
 19 and capacity. There are three conclusions that can be drawn from this illustration:

- 1 1. The Commission's rule for renewable energy requires a comparison to include
2 alternatives that are meeting the utility's same need for capacity and energy.
- 3 2. Such a comparison does not require retail rates to decrease, and in fact are likely to result
4 in an increase in retail rates.
- 5 3. While the renewable resource that meets the Missouri RES should be the least-cost
6 alternative for meeting that need, it need not be the least-cost alternative for meeting the
7 utility's need for energy and capacity.

8 **A. MISSING COMPARABLE ALTERNATIVES**

9 **Q. WHY IS NECESSARY FOR AN ECONOMIC COMPARISON TO INCLUDE**
10 **ALTERNATIVES THAT MEET THE SAME NEED FOR ENERGY AND**
11 **CAPACITY?**

12 A. While the applicants evidence uses what Ms. Kliethermes calls "Production Modeling" and is
13 deficient for all the reason given in her rebuttal testimony, its primary deficiency is that it
14 compares a base case without renewable energy to a change case with renewable energy from
15 the Kansas Wind + DC transmission project. These two alternatives do not meet the same
16 need for capacity and energy. Ms. Kliethermes' rebuttal testimony did not indicate that the
17 Applicant's filing did not present a proper economic comparison for meeting either the
18 Ameren Missouri's RES need, or for meeting its need for capacity and energy.

19 **Q. WAS THERE ANYTHING IN MS. REBUTTAL TESTIMONY THAT IMPLIES A**
20 **PROPER COMPARISON OF ALTERNATIVES SHOULD HAVE BEEN**
21 **INCLUDED?**

22 A. Yes. At lines 23-24 on page 2 of her rebuttal testimony, Ms. Kliethermes points out as
23 information the Commission has previously had available in previous CNN applications for
24 transmission: "*4) The involved RTO/ISO's determination of estimated costs and benefits for*
25 *Missouri investor-owned utilities participating in that RTO/ISO.*"

1 **Q. HOW WOULD THE INCLUSION OF THE INVOLVED RTO/ISO'S**
2 **DETERMINATION OF ESTIMATED COSTS AND BENEFITS HAVE ASSURED A**
3 **PROPER COMPARISON OF ALTERNATIVES?**

4 A. The Southwest Power Pool (SPP) and the Midwest ISO (MISO) use similar approaches in
5 their transmission planning processes. The first step is to determine the most-likely
6 economic mix of generation required to meet the states' RES and the need for generation
7 capacity and energy. This includes the forecasted loads, expected retirements and generation
8 additions of the utilities, but if the time horizon exceeds resource additions known by the
9 utilities (which is almost certain to be the case for 2019), generation expansion modeling is
10 used to fill in what is not yet known. The next step is to determine the best locations for this
11 mix of generation additions. The final step is to determine the most cost-effective
12 transmission upgrades needed to support the reliability of power grid and assure
13 deliverability of the generation to the regional wholesale electricity markets. In addition, any
14 additional transmission upgrades are planned whose Adjusted Production Cost savings from
15 reduced congestion exceed the costs of these economic upgrades.

16 While hourly production cost models that include security constrained economic dispatch
17 are an important component in evaluating the variable costs for alternatives, they are only
18 one of the economic modeling tools used in the RTO planning process. Generation
19 expansion models that include both fixed and variable costs are also important to the first
20 step of the RTO planning process.

21 **Q. HOW DOES THE FIRST STEP OF THE RTO ANALYSIS APPLY TO AN**
22 **ECONOMIC EVALUATION OF AMEREN MISSOURI'S NEED FOR CAPACITY**

1 **AND ENERGY AS WELL AS FOR THEIR NEED FOR RENEWABLE ENERGY TO**
2 **MEET MISSOURI'S RES?**

3 A. First, a proper economic evaluation would calculate the least-cost generation mix for meeting
4 Ameren Missouri's need for capacity and energy without imposing a condition that fifteen
5 percent of their energy needs be met from renewable energy. Then, if the result is that the
6 energy produced by this scenario does not meet the Missouri RES, and therefore does not
7 include the Kansas Wind + DC transmission project, the next step would be to determine the
8 least-cost resource mix that does include renewable resource that account for fifteen percent
9 energy from renewable energy. The Kansas Wind + DC transmission should be included as a
10 possible alternative in this step. As Mr. Beck points out, another alternative that must be
11 considered is the possibility of meeting the Missouri RES with RECs that do not require
12 Ameren Missouri to purchase either capacity or energy. The REC alternative is likely to
13 include the solution to the least-cost generation mix for meeting capacity and energy needs
14 (absent the Missouri RES) with the addition of the costs of the RECs, and this needs to be
15 compared to the scenario where the Kansas Wind + DC transmission is substituted for
16 generation included in the least-cost generation mix. As pointed out in my rebuttal
17 testimony, this substitution would include added capacity from combustion turbines to make
18 up for the lower accredited capacity of the Kansas Wind. There are three possible outcomes
19 from this first step analysis:

- 20 1. Kansas Wind + DC transmission is included in the least-cost generation mix to meet
21 Ameren Missouri's need for capacity and energy without the requirement of meeting
22 15% of energy needs from renewable energy.
- 23 2. Kansas Wind + DC transmission is in the least-cost generation mix to meet Ameren
24 Missouri's need for capacity and energy but only with the requirement to meet 15%
25 of energy needs from renewable energy.

1 3. Kansas Wind + DC transmission is not included in the least-cost generation mix to
2 meet Missouri's need for capacity and energy either with or without the requirement
3 to meet 15% of energy from renewable energy.

4 If the third outcome results, then Kansas Wind + DC transmission is not an economically
5 feasible alternative to be considered, and therefore does not meet the Commission's criteria
6 for need and economic feasibility. If the second outcome results, then Kansas Wind + DC
7 transmission needs to be compared to the least-cost generation mix to meet Ameren
8 Missouri's capacity and energy needs without the requirement of meeting Missouri's RES. If
9 the cost of the generation mix that includes Kansas Wind + DC transmission is more than
10 one percent higher than the least-cost generation mix that excluded meeting the 15%
11 renewable energy requirement, then the Kansas Wind + DC transmission is not qualified to
12 meet the Missouri RES. If the first outcome results, Kansas Wind + DC transmission would
13 qualify as a candidate for meeting both the Missouri RES need and be economically feasible.

14 **Q. WHAT ROLE DO COMPARISONS OF LEVELIZED COSTS PLAY IN THE**
15 **MODELING YOU JUST DESCRIBED?**

16 A. Levelized costs have two possible roles. First, only if the levelized-cost of the Kansas Wind
17 + DC transmission project are lower than all other alternatives could Kansas Wind + DC
18 transmission possibly be included in the least-cost generation mix for meeting Ameren
19 Missouri's need for capacity and energy without the Missouri RES being imposed as a
20 condition.

21 Second, only if the levelized-cost of the Kansas Wind + DC transmission is lower than all
22 other renewable energy alternatives could Kansas Wind + DC transmission possibly be
23 included in the least-cost generation mix for meeting Ameren Missouri's need for capacity
24 and energy with the Missouri RES being imposed as a condition.

1 **Q. IS HAVING THE LOWEST LEVELIZED COST SUFFICIENT EVIDENCE THAT A**
2 **PROPOSED ALTERNATIVE IS ECONOMICALLY FEASIBLE FOR MEETING**
3 **THE NEED FOR CAPACITY AND ENERGY OR RENEWABLE ENERGY?**

4 A. While having the lowest levelized cost is a necessary condition, it is not sufficient to
5 determine economic feasibility. This is because there are additional transmission related
6 costs associated with the Kansas Wind + DC transmission project that levelized cost analysis
7 is not designed take into account.

8 **B. MISSING TRANSMISSION UPGRADE COSTS**

9 **Q. WHAT DOES MS. KLIETHERMES SEE AS MISSING IN THE ECONOMIC**
10 **ANALYSIS THAT SHOULD HAVE BEEN PROVIDED FROM THE INVOLVED**
11 **RTOS?**

12 A. At lines 19-24 of page 2 Ms. Kliethermes points out that the applicant did not provide
13 estimates of costs and benefits from the RTOs that would be affected by the Grain Belt
14 Express project, and more specifically costs and benefits for Missouri utilities. Also, at lines
15 24-26 of page 3 Ms. Kliethermes points out that added information is needed on

16 *“Production, transmission, and economic modeling or analysis to determine:*

- 17 • *The cost of transmission upgrades that may be economical to resolve the transmission*
18 *constraints that its energy injections will cause or exacerbate.”*

19 **Q. DO YOU AGREE WITH MS. KLIETHERMES’ FINDINGS OF DEFICIENCY?**

20 A. Generally, I agree. However, while finding transmission upgrades needed to support the
21 Kansas Wind + DC transmission is critical to evaluating the overall cost of that project, such
22 findings must be put in the context of alternatives that meet the need for Missouri RES and
23 the need for Ameren Missouri’s energy and capacity. Combining the economic comparison
24 required by Commission rules for the retail rate impact test with what Ms. Kliethermes points

1 out as missing implies that the transmission upgrades needed to support all comparable
2 alternatives are required as part of these comparison. This is where the second (location of
3 generation) and third (cost of required transmission upgrades) steps of the RTO analysis
4 come into play.

5 At lines 13-14 on page 11, Ms. Kliethermes points out: *“Staff is primarily concerned that*
6 *the Project will create a great deal of transmission congestion in northeastern Missouri.”*

7 Also, on the first page of the Midwest ISO’s Regional Generation Outlet Study (RGOS,
8 November, 2010), it states: *“During initial RGOS phases, analysis showed locating wind*
9 *zones in a distributed manner throughout the system—as opposed to only locating the wind*
10 *local to load or regionally where the best wind resources are located—results in a set of*
11 *least-cost wind zones that help to reduce the delivered dollar per MWh cost needed to meet*
12 *renewable energy requirements.”* Applying this to the Grain Belt Express proposal implies
13 that the location of the converter station chosen by the applicant is critical because its
14 location might create a significant amount of needed upgrades on the Ameren Missouri
15 transmission system. Thus, added transmission costs need to be taken into account when
16 comparing costs of alternative generation mixes for both non-renewable and renewable
17 generation alternatives. For example, if RECs were purchased from wind farms located in a
18 “distributed manner” across the MISO footprint where the transmission system is more
19 robust, or if Combined Cycle generation is located within the Ameren Missouri transmission
20 system where there is more robust transmission, the costs of transmission upgrades would
21 likely be much smaller.

22 **Q. WHAT ARE SOME OF THE OTHER DEFICIENCIES BROUGHT OUT IN MS.**
23 **KLIETHERMES’ REBUTTAL TESTIMONY?**

1 A. Ms. Kliethermes correctly points out that the applicant’s production modeling is deficient in
2 several other aspects including: a) failure to determine economic impact on Missouri and b)
3 failure to determine economic impact on need for ramping and regulation services.

4 **C. MISSING ECONOMIC IMPACT SPECIFIC TO MISSOURI**

5 **Q. WHY IS FAILURE TO DETERMINE ECONOMIC IMPACT ON MISSOURI**
6 **IMPORTANT TO DETERMINING ECONOMIC FEASIBILITY?**

7 A. As I pointed out in my rebuttal testimony, the hourly production costs models used by both
8 SPP and MISO measure Adjusted Production Costs for each utility/local transmission pricing
9 zone. This analysis includes not only the production costs of each utility, but also the
10 purchases and sale of energy in the wholesale energy market. The importance of revenues
11 from the sale of energy into the wholesale energy market is discussed by Ms. Kliethermes at
12 pages 8 and 9 of her rebuttal testimony where she concludes: *“Therefore, using this crude*
13 *analysis, it is likely that the Project would decrease Ameren Missouri’s cost to serve load by*
14 *roughly \$7.6 million, but would also decrease Ameren Missouri’s OSSMR by an amount*
15 *greater than \$7.6 million.”* A hourly security constrained economic dispatch analysis that
16 measures Adjusted Production Costs for Ameren Missouri is needed to verify Ms.
17 Kliethermes’ “crude analysis.”

18 **Q. DOES THE LEVELIZED COST OF ENERGY ANALYSIS PROPOSED BY THE**
19 **APPLICANT PROVIDE SUFFICIENT INFORMATION TO MEET THE**
20 **CRITERION OF ECONOMIC FEASIBILITY?**

21 A. As discussed above, Ms. Kliethermes points out in her rebuttal testimony the impact on
22 revenues from sales is an important aspect of correctly determining costs, and those impacts

1 are not included in a levelized cost of energy analysis. In addition, a levelized cost analysis
2 cannot take into account the impact on costs for ramping and regulation.

3 **D. MISSING COSTS FOR RAMPING AND REGULATION**

4 **Q. WHAT IS THE IMPACT ON PRODUCTION COSTS FOR RAMPING AND** 5 **REGULATION?**

6 A. Ramping, in the context of wind generation, is associated with the higher amount of
7 generation needed to fill in for the change in power output that occurs with five-minute
8 changes in wind speeds. Thus, five-minute wind speed data is required to determine the
9 amount of added ramping needed. If this added ramping requires higher cost generation that
10 can ramp up and down faster than lower cost generation, then the production costs associated
11 with ramping will increase.

12 What is likely to have a greater impact on production costs is related to the moment-to-
13 moment changes in wind speeds that occur within a five-minute period. These changes in
14 wind speeds will be met from generating units that are on Automatic Generation Control
15 (AGC). AGC units respond instantaneously to changes in load and wind generation. Think
16 of the real-time dispatch as including two components: generators dispatched to ramp up or
17 down to a specified level over the next five minutes, and AGC units that reserve a portion of
18 their generating capacity to respond to any instantaneous differences between load and
19 generation.

20 The greater the amount of variation in wind speed within a five-minute period, the more
21 generation capacity needs to be reserved on AGC units to regulate; i.e., to meet these
22 variations with more or less energy. The more AGC capacity needed, the less generating

1 capacity is available to dispatch to a specified level and with less generation available, the
2 greater are the overall production costs.

3 **Q. DO YOU AGREE WITH MS. KLIETHERMES' RECOMMENDATION THAT**
4 **REAL-TIME PRODUCTION COST MODELING IS NEEDED TO ESTIMATE THE**
5 **COSTS ASSOCIATED WITH RAMPING AND REGULATION?**

6 A. I agree that real-time production cost modeling comparing Kansas Wind + DC transmission
7 to alternatives that provide the same services would produce useful information on additional
8 ramping requirements. However, because a five minute dispatch interval is used in real-time
9 dispatch, real-time production cost models can only be run for relatively short time periods,
10 such as one week, and even then do not capture instantaneous variability in load and wind
11 generation that can impact regulation. As an analyst, I would first look for data to apply
12 statistical analysis of historical data between load variability and required ramping and AGC
13 capacity, where load variability is measured by subtracting wind generation from the load.
14 Because of the difficulty in providing analysis of added ramping and regulation costs, I
15 would require the added ramping and regulation costs only when Kansas Wind + DC
16 transmission, with all the previous costs previously discussed included, turns out to be the
17 least-cost alternative for meeting Ameren Missouri's need for renewable energy. Based on
18 the levelized cost results from my rebuttal testimony and the use of RECs as an alternative
19 for meeting the Missouri RES, I do not believe there is any sound evidence that Kansas Wind
20 + DC transmission is likely to be the least-cost alternative for meeting Ameren Missouri's
21 need for renewable energy.

22 **E. MODELING AND EVALUATION SEQUENCING**

1 **Q. DOES EVERY ASPECT OF THE MODELING COMPONENTS THAT MS.**

2 **KLIETHERMES HAS RECOMMENDED SUBJECT TO YOUR MODIFICATIONS**
3 **HAVE TO BE IMPLEMENTED IN ORDER TO EVALUATE WHETHER OR NOT**
4 **KANSAS WIND + DC TRANSMISSION MEETS THE “TARTAN” CRITERIA FOR**
5 **NEED AND ECONOMIC FEASIBILITY?**

6 A. Not necessarily. In Schedule MSP-3 are listed the five modeling components that are
7 currently missing and are needed to evaluate need and economic feasibility. The first two
8 require modeling the least-cost generation mix with and without the Kansas Wind + DC
9 transmission alternative. This is required in order to have the two alternatives required by the
10 Commission’s rule on renewable energy. Since the need can be either for capacity and
11 energy without renewable resources (Model 1) or for capacity and energy with renewable
12 resource (Model 2), if Kansas Wind + DC transmission is included in the lowest cost solution
13 to the first modeling step, it is not necessary to run the second modeling step, and the
14 analysis can proceed to the third modeling step. If not, then it is necessary to run the second
15 modeling. If the least-cost solution to the second modeling step includes Kansas Wind + DC
16 transmission but is more than 1% than the least-cost solution to the first modeling step, then
17 Kansas Wind + DC transmission fails to meet the Missouri RES rate impact condition and is
18 eliminated. In this case, no further modeling is required.

19 **Q. IF KANSAS WIND + DC TRANSMISSION MAKES IT PAST THE FIRST TWO**
20 **MODELING STEPS, WHY DO YOU INCLUDE TRANSMISSION UPGRADES AS**
21 **THE NEXT STEP?**

22 A. If Kansas Wind + DC transmission makes it to modeling step 3, whether by way of modeling
23 step 1 or modeling step 2, there will be two alternative least-cost generation mixes: 1) one

1 with Kansas Wind + DC transmission; and 2) one without Kansas Wind + DC transmission.
2 However, the modeling in the first two steps does not include security constrained economic
3 dispatch; it simply looks at Ameren Missouri's need for capacity and energy and evaluates
4 the costs irrespective of transmission requirements.

5 To properly model the Adjusted Production Costs for these two alternatives it is critical
6 to add the transmission upgrades required for these alternative generation mixes. If this is
7 not done prior to running the security constrained dispatch, the results will not correctly
8 represent the dispatch from the two generation mix alternatives. Thus, the next step is to
9 determine the transmission upgrades required for both alternatives. If the costs of these
10 upgrades results in Kansas Wind + DC transmission going more than 1% above the
11 alternative, then it fails to meet the Missouri RES rate impact condition and is eliminated.

12 **Q. IF AT STEP 3, KANSAS WIND + DC TRANSMISSION PASSES THE MISSOURI**
13 **RES RATE IMPACT CONDITION, WHAT IS THE NEXT STEP?**

14 A. In the sequencing I have included estimating the amount of ramping and regulation needed
15 for both alternatives as the next step. Then in the final step 5 these estimates along with the
16 upgraded transmission system for both alternatives are used as inputs into the security
17 constrained economic dispatch model to determine the level of Adjusted Production Costs for
18 each of the generation mixes. Only if the generation mix with Kansas Wind + DC
19 transmission is less than or equal to 1% of the costs of the generation mix without Kansas
20 Wind + DC transmission will it meet the Missouri RES rate impact condition and the "Tartan
21 criteria for need and economic feasibility.

1 **Q. IN COMPARING THE GENERATION MIXES WITH AND WITHOUT KANSAS**

2 **WIND + DC TRANSMISSION WHAT EXACTLY DO YOU MEAN BY “LESS THAN**
3 **OR EQUAL TO 1%?”**

4 A. In the first two steps, generation expansion models are used. As a part of this modeling the
5 costs of the existing electric system for Ameren Missouri along with depreciation and
6 retirements over the next eleven years should be included. Because the Commission’s rules
7 specify this comparison be made for the “total retail revenue requirement,” the 1% rate
8 impact test must include these embedded costs in the comparison.

9 **IV. RECOMMENDATION – CROSS-SURREBUTTAL TO STAFF’S POSITION**

10 **Q. WHAT IS YOUR RECOMMENDATION TO THE MISSOURI COMMISSION?**

11 A. The Applicant must show its proposal has met the Commission’s conditions for granting a
12 CNN. Since those conditions have not been met based on the evidence presented by the
13 Applicant, at this time the Commission should deny their application for a CNN. Moreover,
14 they should not approve the application subject to conditions as has been proposed by Staff at
15 page 18 of Mr. Beck’s rebuttal testimony where he characterizes Staff conditions as: *“the list*
16 *of conditions recommended by Staff should the Commission grant Grain Belt Express’*
17 *request for a Certificate of Convenience and Necessity.”* If instead the Commission decides
18 to grant the Applicant a CNN subject to conditions, then I recommend that the Staff’s
19 conditions be amended to include the elements presented in Schedule MSP 3, attached.

20 **Q. DOES THIS CONCLUDE YOU’RE CROSS-SURREBUTTAL TESTIMONY?**

21 A. Yes, it does.

BEFORE THE PUBLIC SERVICE COMMISSION
OF THE STATE OF MISSOURI

In the Matter of the Application of Grain Belt Express)
Clean Line LLC for a Certificate of Convenience and)
Necessity Authorizing it to Construct, Own, Operate,)
Control, Manage, and Maintain a High Voltage, Direct) Case No. EA-2014-0207
Current Transmission Line and an Associated Converter)
Station Providing an interconnection on the Maywood-)
Montgomery 345 kV Transmission Line)

AFFIDAVIT OF MICHAEL S. PROCTOR

STATE OF MISSOURI)
) ss
COUNTY OF Jefferson)

Michael S. Proctor, being first duly sworn on his oath, states:

1. My name is Michael S. Proctor. I am currently an independent consultant. My home address is 2172 Butterfield Drive, Maryland Heights, MO 63043.
2. Attached hereto and made a part hereof for all purposes is my Cross-Surrebuttal Testimony on behalf of Show Me Concerned Landowners, consisting of 18 pages, all of which have been prepared in written form for introduction into evidence in the above-referenced docket.
2. I hereby swear and affirm that my answers contained in the attached testimony to the questions therein propounded are true and accurate to the best of my knowledge, information and belief.

Michael S Proctor
Michael S. Proctor

Subscribed and sworn to before me this 14th day of October, 2014.

SHANNON LYNN O'HERON
Notary Public - Notary Seal
STATE OF MISSOURI
Jefferson County
My Commission Expires: May 23, 2017
Commission # 13478356

[Signature]
Notary Public

Modeling Required for Meeting the “Tarter” Criteria for Need and Economic Feasibility

A. Modeling

1. Absent a Missouri RES, determine the least-cost generation mixes for meeting Ameren Missouri’ need for capacity and energy with and without the Kansas Wind + DC transmission alternative over the 11 year period from 2019 through 2029.
2. Including a Missouri RES, determine least-cost generation mixes for meeting Ameren Missouri’ need for capacity and energy that evaluates the Kansas Wind + DC transmission alternative against other renewable energy alternatives including RECs over the 11 year period from 2019 through 2029.
3. Include transmission upgrades required for integrating the both generation mixes (i.e., with and without Kansas Wind + DC transmission) into the Midwest ISO footprint.
4. Estimate amount of ramping and regulation capacity needed for both generation mixes – with and without Kansas Wind + DC transmission.
5. Using an hourly security constrained dispatch model, for both generation mixes determine the Adjusted Production Costs for Ameren Missouri for 2019, 2024 and 2029. Linearly interpolate Adjusted Production Costs between years.

B. Evaluation: Modeling Sequencing

A red N (no) means KC Wind + DC transmission is not economically feasible at the step and no further steps are required.

