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Representing Wasatch Wind

BEFORE THE PUBLIC SERVICE COMMISSION OF UTAH

IN THE MATTER OF THE PETITION OF
WASATCH WIND, LLC FOR APPROVAL
OF A CONTRACT FOR THE SALE OF
CAPACITY AND ENERGY FROM THEIR
PROPOSED QF FACILITIES

DOCKET NO. 06-035-42

IN THE MATTER OF THE APPLICATION
OF PACIFICORP FOR APPROVAL OF
POWER PURCHASE AGREEMENT
BETWEEN PACIFICORP AND SPANISH
FORK WIND PARK 2, LLC

DOCKET NO. 06-035-76

SURREBUTTAL TESTIMONY OF RICHARD S. COLLINS

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Wasatch Wind hereby submits the Prefiled Testimony of Richard S. Collins in this docket.

DATED this 15TH day of February, 2007.

Richard S. Collins

/s/ _____
Richard S. Collins
Representing Wasatch Wind

CERTIFICATE OF SERVICE

I hereby certify that a true and correct copy of the foregoing was sent by United States mail, postage prepaid, or by email this 15th day of, February 2007, to the following:

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SURREBUTTAL TESTIMONY

Of

RICHARD S. COLLINS

On behalf of Wasatch Wind

IN THE MATTER OF THE PETITION OF WASATCH WIND, LLC FOR APPROVAL OF A
CONTRACT FOR THE SALE OF CAPACITY AND ENERGY FROM THEIR PROPOSED
QF FACILITIES

Docket No. 06-035-42

IN THE MATTER OF THE APPLICATION OF PACIFICORP FOR APPROVAL OF POWER
PURCHASE AGREEMENT
BETWEEN PACIFICORP AND SPANISH FORK WIND PARK 2, LLC

Docket No. 06-035-76

February 15, 2007

1 **Q. Please state your name and occupation.**

2 A. My name is Richard S. Collins. I am an Associate Professor of Economics and
3 Finance at Westminster College located at 1840 South 1300 East, Salt Lake City,
4 UT 84108.

5 **Q. On whose behalf are you filing testimony in this Docket?**

6 A. Wasatch Wind, LLC

7 **Q. Are you the same Richard Collins that submitted prefiled direct AND**
8 **rebuttal testimony in this docket?**

9 A. Yes. I am.

10 **SUMMARY OF TESTIMONY**

11 **Q: What is the purpose of your surrebuttal testimony?**

12 A: I rebut the testimony of Mr. Paul Clements and Mr. Mark Adams. I explain why
13 their criticisms of Wasatch Wind's recommended methodology are incorrect and
14 why their proposed method has theoretical flaws and is too simplistic to
15 accurately estimate avoided line losses.

16

17 **Rebuttal of Mr. Clements**

18 **Q: Mr. Clements criticizes your review of the Company's previous testimony on**
19 **transmission, do you care to comment?**

20 **A:** Yes, I would like to comment. My testimony points out the inconsistencies in the
21 Company's early testimony and its testimony in this case. Mr. Clements is
22 contradicting past Company testimony and proposing a simplistic method. The

1 Commission rejected past proposals because they lacked evidence to support their
2 conclusions. The Company's current testimony fails to address this concern and
3 should be ignored.

4 **Q: Has the company proposed this method as a standard for QF line loss**
5 **calculations?**

6 **A:** No the Company specifically states that this method applies to this case. There is
7 good reason for this stance. Based on the proposed methodology, there is no
8 possible way for any QF to be credited with avoided line losses.

9 **Q: Mr. Clements criticizes your use of a power flow model to determine avoided**
10 **line losses associated with the Spanish Fork Facility. Are his criticisms**
11 **valid?**

12 **A:** No, Mr. Clements criticisms of the use of power flow models to estimate line
13 losses are poorly constructed and rest on a faulty assumption. He states "First, the
14 price for Spanish Fork Wind Park 2 is based on the price for a proxy resource, and
15 any adjustments to that price are to be made only to the extent the resource has
16 characteristics that vary from the proxy resource" (Clements Rebuttal line 54-56).
17 This statement is correct. Adjustments to the price that a QF receives should be
18 made by direct comparison to the proxy resource. However, he errors in his next
19 statement. "To compare line losses incurred by the proxy resource to line losses
20 incurred by the QF resource, one **must** compare the distance the output of the
21 projects must travel before being consumed by load." (emphasis added, see
22 Clement Rebuttal lines 57-59). Although line losses are related to distance, it is

1 well recognized that there are many other variables that affect line losses:
2 transformer conversions, line loading, temperature, what resources are backed
3 down. Mr. Clement's proposed methodology neglects these other variables and
4 as such can lead to false conclusions.

5 **Q: Mr. Clements criticizes the use of power flow models because they do not**
6 **compare losses to the proxy resource, he states "Mr. Collins' use of power**
7 **flow models includes studies that compare Spanish Fork Wind Park 2 to**
8 **resources besides the proxy resource, and he uses the results of these studies**
9 **to draw his conclusions and make his recommendations." (Ibid, line 60-64)**
10 **Could you comment on this criticism?**

11 **A:** Mr. Clements either fails to understand our use of the power flow model or is
12 mischaracterizing the use of the power flow model. We use the power flow
13 model to make a direct comparison between the line losses of Spanish Fork
14 Facility and the Wolverine facility which is the proxy resource. Two separate
15 types of analysis were performed. First, we ran the model with normal Wolverine
16 production and no Spanish Fork production as a base case. Next we substituted
17 19 MWs of power from the Goshen substation where Wolverine connects with the
18 PacifiCorp system and injected 19 Mws of power into the Spanish Fork substation
19 approximately 1.2 miles from where our facility interconnects. This was run five
20 times under different scenarios that varied by year season and load. In every case,
21 line losses were reduced when power was received at Spanish Fork rather than at
22 Wolverine. This provides a direct comparison of the impact of adding power at

1 Spanish Fork rather than Wolverine and measures the effect on the system and its
2 associated line losses. A second method used to make a direct comparison of line
3 losses associate with Spanish Fork vs. Wolverine. The power flow model was
4 run with and without 19 MWs of power from Spanish Fork and then compare the
5 results to model runs with and without Wolverine's 19 MWs of power. In each
6 case, we backed down generation from other sources to accommodate the
7 additional power injected into the system. We relied on Company-provided
8 GRID data that indicated which resources were backed down. Contrary to Mr.
9 Clements assertions, this provides a direct comparison of the line losses of
10 Spanish Fork with Wolverine.

11 **Q: Mr. Clements continues to criticize your method because there was variation**
12 **in the model results. The model runs yielded differences in line losses**
13 **estimations and therefore he concludes that the method is unreliable. Is this**
14 **criticism valid?**

15 **A:** No his criticism is not valid. We would expect that line losses would vary
16 depending on the year, season and line loading because line losses are dynamic.
17 We have made eleven separate comparisons of line losses of Spanish Fork
18 compared directly to line losses of Wolverine. We have varied years, seasons and
19 loading conditions. In ten out of the eleven cases, Spanish Fork's facility resulted
20 in lower line losses than the Wolverine. These results are impressive and robust.
21 The Company on the other hand has presented a simplistic method that neglects
22 important variables to determining line losses. It is the Company's method that

1 puts the ratepayer at risk for not achieving rate neutrality.

2 **Q: Mr. Clements criticizes your recommendation for a simplified method that**
3 **calculates avoided line losses based on the location of the wind facility and**
4 **your recommendation that line losses be calculated at the FERC OATT rate.**
5 **Could you comment?**

6 **A:** It appears that Mr. Clements has issues with line losses being paid at the FERC
7 OATT rate when actual line losses might be higher or lower than this average.
8 This appears to be a small concern in the context of the big picture, transmission
9 losses are added to any wholesale transaction that the Company engages in
10 regardless of the actual line losses. Further, the size of these wholesale
11 transactions dwarfs the magnitude of line losses associated with QFs. Secondly,
12 he brings up the Pioneer Ridge contract and the fact that it does not include
13 transmission losses in spite of the fact that it is within the Utah bubble. This is a
14 non-issue, the decision of Pioneer Ridge not to pursue transmission losses was
15 their's to make, it was part of the contract negotiations.

16 **Q: Isn't there a more important point in your recommendation to use the**
17 **location of the QF facility as a means of determining whether it should be**
18 **awarded avoided transmission losses?**

19 **A:** Yes, there is. As quoted above, Mr. Clements testified "any adjustments to [the
20 QFcontract] price are to be made only to the extent the [QF] resource has
21 characteristics that vary from the proxy resource." My recommendation to use
22 the location of the QF facility recognizes the fact that generation facilities located

1 in a transmission constrained area are more valuable to the utility than facilities
2 located on the far side of a transmission constraint. As the testimony of Mr.
3 Clements indicates benefits associated with that characteristic should be
4 recognized and compensation in order to make rate payers neutral. My simplified
5 recommendation attempted to recognize this fact and tie transmission losses and
6 location advantages into one simple compensation principle.

7 **Q: Is Location Pricing recognized by in other parts of the country?**

8 **A:** Yes, the New England ISO practices locational pricing known as LMP or
9 Locational Marginal Pricing, they will pay a premium for power generated within
10 a transmission constrained area, like the Wasatch Front Bubble. In addition the
11 New England ISO pays additional line losses on top of FERC OATT rate for
12 power generated within these constrained areas.

13 **Rebuttal of Mr. Adams**

14 **Q: Mr. Adams states that the Company and the Division have developed a**
15 **distance based method of calculating avoided line losses and that a complex**
16 **power flow model should not be used. Can you comment?**

17 **A:** Mr. Adams should recognize that line losses are affected by many more variables
18 than mere distance and therefore both the Company's and the Division's proposed
19 method is deficient and can not assure ratepayer neutrality. In the past, I have
20 argued for the Ockham's Razor principle, which basically states that when
21 confronted with two methods that solve a problem that are equally accurate, you
22 should select the least complicated method. However, there is an important

1 caveat to this principle, the two competing solutions should be equally accurate.

2 The Company's simplistic method lacks accuracy because known variables are
3 left out of the analysis.

4 **Q: What problems exist with the distance formulation of line losses?**

5 **A:** It does not measure the actual flow of electricity on the system and therefore can
6 not determine the actual impact on line losses; it does not consider the line losses
7 that occur when electricity changes voltages. It does not consider the existing
8 loading of the lines, losses will vary depending on line loading.

9 **Q: Mr. Adams testifies that the Company ran its own power flow studies in the**
10 **spirit of cooperation and that the results indicate that avoided line losses**
11 **between the two resources were minimal. Please comment.**

12 **A:** The Company provided results of only one case that compared the results of the
13 lines losses associated with the Wolverine with the line losses associated with the
14 Spanish Fork facility. The results show a minimal difference between the two.
15 However, these results are fatally flawed. The Company selected to back down
16 the generation of the Jim Bridger plant located in Wyoming. This arbitrary
17 decision could prejudice the outcome. Wasatch Wind relied on the output of the
18 GRID model to determine which generation resource to back down. We remind
19 the Commission that it has already accepted the validity of this model as it is used
20 to determine the avoided energy costs for thermal QF resources. We requested
21 the Company provide us the output from GRID showing what resources would be
22 backed down if 19 MWs of power was generated at Spanish Fork, we asked the

1 same for Wolverine. The output was examined and not once was Jim Bridger
2 backed down for either resource. Most of the time either a market transaction was
3 changed or a Utah thermal resource was backed down. Our runs are based on
4 generation located near where the market transaction occurred.

5 **Q: Mr. Adams is critical of the model that you used in your power flow studies**
6 **and claims that the model he used was more accurate because it was heavily**
7 **modified to include the sub-transmission facilities and therefore includes the**
8 **impedance of those sub-transmission lines. Could you comment?**

9 **A:** It is true that Mr. Adams used a modified model to run his case study and that his
10 model may be more accurate than the base model we used to estimate losses on
11 the system. This is precisely why we requested that the Company run our
12 scenarios on their model. In fact Mr. Adams states that in spite of the fact that
13 Mr. Collins knew of that the process was very time consuming and expensive he
14 requested several model runs. Wasatch Wind was very disappointed that the
15 Company refused to make these runs because we did not have access to the
16 modified model and knew the Company would argue that the base model would
17 be inferior. Curiously, the major time and cost of running these models is the
18 initial set up to modify the base model, something the Company has already
19 performed.

20 **Q: Have you performed any analysis of the line losses associated with the sub-**
21 **transmission system of the area around the Spanish Fork facility?**

22 **A:** Yes, we have. Mr. Mike Unger prepared some calculations of the potential line

1 losses associated with transporting power from the Spanish Fork facility to
2 Santaquin and the results are shown in the attached exhibit Wasatch Surrebuttal
3 Exhibit 1.1. The results show that the amount of losses are small, around one
4 percent, and this contradicts Mr. Adams' assertion that line losses on the sub-
5 transmission level would be large. In addition, this is only one half of the
6 necessary analysis. The second half would calculate the transmission losses of
7 the generation that was backed down as a result of Spanish Fork's generation.
8 Under most conceivable instances this would be a positive line loss and may even
9 be larger than the line loss incurred by Spanish Fork thereby indicating an
10 additional payment to the Spanish Fork facility.

11 **Q: Mr. Adams accuses Wasatch Wind of making a fundamental error in its**
12 **calculation by including the 14 miles of distance between the Wolverine**
13 **project and the Goshen substation and therefore our calculations**
14 **overestimate the avoided line losses? Is he correct?**

15 **A:** No, Mr. Adams is in error; in ever case we assumed that the interconnection point
16 for Wolverine was at Goshen. In our power flow runs we injected or withdrew
17 power at Goshen not at the generation site.

18 **Q: Mr. Adams claims that you made an error in your calculation of avoided line**
19 **losses in your rebuttal of Dr. Abdulle. He recommends the use of the first 19**
20 **MWs of Wolverine to compare with the 19MWs of Spanish Fork.**

21 **A:** Mr. Adams is an engineer and he is arguing an economic concept. Avoided costs
22 are akin to marginal costs any comparison of these two projects will look at the

1 marginal transmission losses not some average. Marginal transmission losses are
2 associated with the last kilowatt produced not some other kilowatt as suggested by
3 Mr. Adams.

4 **Q: Mr. Adams also is critical of your correction of Dr. Abdulle proposed method**
5 **of calculating avoided line losses. He notes that the load at Mapleton is not**
6 **large enough to handle the maximum output of the Spanish Fork Facility**
7 **and would have to travel further. Care to comment?**

8 **A:** Mr. Adams has a point if you are to use that method. We do not recommend this
9 method, it is inaccurate. In addition, much of the time the Spanish Fork facility
10 will be running below full capacity and his point is a non-issue. The power flow
11 model takes all of these issues into account and provides a more accurate
12 prediction of line losses.

13 **Q: Mr. Adams claims that the load at Goshen is large enough to handle the 19**
14 **MWs of power from Wolverine and therefore there are no line losses**
15 **associated with Wolverine. Is he correct?**

16 **A:** No, this argument fails the marginal cost criteria and should be discarded. In
17 addition, it is immaterial if the power is consumed at Goshen, generation of a
18 resource can affect the dispatch of the system and affect line losses on the entire
19 system, the power flow model measures those impacts.

20 **Q: Does this conclude your testimony?**

21 **A:** Yes, it does.

22