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TESTIMONY OF

DAVID L. GILMAN and MARK A. JACKSON

Witnesses for Bonneville Power Administration

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5 **SUBJECT: WIND INTEGRATION - WITHIN-HOUR BALANCING SERVICE RATE**
6 **DESIGN**

7 **Section 1: Introduction and Purpose of Testimony**

8 *Q. Please state your names and qualifications.*

9 A. My name is David L. Gilman. My qualifications are stated at WI-09-Q-BPA-05.

10 A. My name is Mark A. Jackson. My qualifications are stated at WI-09-Q-BPA-07.

11 *Q. What is the purpose of your testimony?*

12 A. The purpose of this testimony is to sponsor a new ACS-09 Control Area Service rate
13 schedule for Wind Integration - Within-Hour Balancing Service (the "Wind Integration -
14 Within-Hour Balancing Service Rate").

15 *Q. How is your testimony organized?*

16 A. This testimony is organized into three sections starting with this Introduction. Section 2
17 describes the Wind Integration - Within-Hour Balancing Service. Section 3 describes the
18 calculation of the Wind Integration - Within-Hour Balancing Service Rate.

19 **Section 2: Wind Integration - Within-Hour Balancing Service Rate**

20 *Q. Please briefly describe Wind Integration - Within-Hour Balancing Service.*

21 A. Wind Integration - Within-Hour Balancing Service provides the generation capability to
22 follow within-hour variations of wind resources in the BPA Balancing Authority Area.
23 Within-Hour Balancing Service is required to maintain the power system frequency at 60
24 Hertz in conformance with NERC and WECC reliability standards. See McManus and
25 Enyeart, WI-09-E-BPA-02.

26 *Q. Please describe the proposed Wind Integration - Within-Hour Balancing Service rate.*

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1 A. The proposed rate of \$0.81 per kW per month will apply to the monthly installed capacity
2 for each wind generator in the BPA Control Area (also referred to as Balancing Authority
3 Area). The Wind Integration - Within-Hour Balancing Service Rate will be a Control
4 Area Services rate because it applies to generators rather than to transmission customers.
5 This rate is proposed to be effective for Fiscal Year 2009 (October 2008 – September
6 2009). The proposed rate schedule is in Attachment A.

7 *Q. Please explain the relationship of the Wind Integration - Within-Hour Balancing Service*
8 *Rate to the Generation Imbalance Rate.*

9 A. The Wind Integration - Within-Hour Balancing Service Rate recovers the cost of
10 providing within-hour balancing capacity for the within- hour variations of wind
11 resources as the output of wind resources increases and decreases. In contrast, the
12 Generation Imbalance rate recovers the energy costs BPA incurs to meet the difference
13 between scheduled and actual energy delivered from generation resources in the BPA
14 Balancing Authority Area during a schedule hour. Because wind generation can
15 continually increase and then decrease within the hour as the weather patterns change,
16 scheduled and actual energy are likely to differ for the hour even if BPA continually
17 balances for the within-hour changes.

18 *Q. Please explain the difference between Wind Integration - Within-Hour Balancing Service*
19 *and Regulation and Frequency Response.*

20 A. Regulation and Frequency Response (RFR) service provides balancing for the moment-
21 to-moment variations in load, while Wind Integration - Within-Hour Balancing Service
22 provides balancing for wind resources. The variability of both wind resources and loads
23 contributes to the total balancing authority area balancing requirement. The cost of
24 balancing service for load will continue to be recovered under the RFR service rate and
25 will not be recovered under the Wind Integration - Within-Hour Balancing Service Rate.
26

Section 3: Calculation of the Rate For Wind Integration - Within-Hour Balancing

Service

Q. How did you calculate the proposed Wind Integration - Within-Hour Balancing Service rate?

A. The proposed rate of \$0.81 per kW per month is determined by dividing the annual revenue requirement of \$22,867,842 by the forecast annual sum of the monthly installed wind generating capacity of 28,124,000 kW. Attachment B shows the summary of the rate calculation.

Q. How did you determine the revenue requirement?

A. The revenue requirement is the amount Transmission Services expects to pay BPA's Power Services for reserve capacity. Power Services is proposing a charge of \$9.39/kW per month for reserve capacity resulting in a revenue requirement of \$22,867,842. See Bermejo, et al., WI-09-E-BPA-03.

Q. How did you calculate the forecast annual sum of the monthly installed wind generating capacity?

A. The forecast of installed wind generating capacity for FY 2009 is 2,237 MW for the first 10 months of the rate period and 2,877 MW for the last two months of the rate period for a total of 28,124,000 kW for FY 2009. See Attachment B.

Q. How will you determine the billing factor for installed capacity for purposes of applying the rate?

A. BPA will determine the installed capacity for each wind plant in the BPA Balancing Authority Area each month during the rate period. For wind projects that have completed installation of all units, the installed capacity will be the aggregate nameplate of the generating units. For wind projects for which some but not all units are installed (that is, some units are generating energy), BPA will use as a surrogate for installed capacity the maximum hourly output measured through the 15th day of the month. Using the

1 maximum hourly output of the generating units enables BPA to approximate the total
2 installed capacity for wind projects that are still under construction. This approximation
3 is necessary because, for wind projects still under construction, BPA will not know the
4 exact amount of installed capacity at any given time. Based on general observations of
5 hourly output of existing wind projects, we expect that at some point during the first 15
6 days of the month, the wind speed will be high enough for the installed units to produce
7 the maximum output. Thus, the maximum hourly output measured through the 15th day
8 of the month is a reasonable proxy for installed capacity requiring Wind Integration -
9 Within-Hour Balancing Service. In addition, using the 15th day of the month as a cutoff
10 date provides BPA sufficient time to prepare the monthly billing. Additional wind
11 turbines installed after the 15th will be picked up during the next monthly billing cycle.

12 *Q. Why is BPA using the monthly installed capacity as the billing factor?*

13 A. Installed wind capacity is the major factor in determining the amount of reserve capacity
14 that must be set aside for this service, and therefore charging the rate based on installed
15 capacity follows principles of cost causation. BPA based the amount of reserve capacity
16 that must be set aside for this service on the installed wind generation capacity in BPA's
17 Control Area. *See* McManus and Enyeart, WI-09-E-BPA-02. In addition, ease of
18 administration was also a consideration in proposing this billing factor.

19 *Q. What other billing factors did you consider?*

20 A. We considered using a billing factor of energy generated during the month. We did not
21 use this billing factor because the reserve capacity requirement is not a function of energy
22 produced, and therefore energy produced is not a good indicator of costs. In addition,
23 this billing factor would have disadvantaged wind generators with a high capacity factor.
24 Capacity factor is the ratio of energy produced to installed generating capacity for a
25 specified period of time.
26

1 Q. *Is BPA currently recovering any wind-related balancing costs in its 2008 Transmission*
2 *and Ancillary Services Rates?*

3 A. As part of the 2008 Transmission Rate Case Settlement for the FY 2008-2009 rate period,
4 BPA included \$2,193,000 per year in the transmission revenue requirement for the costs
5 of 25 MW of regulating reserve for wind generation at a price of \$7.31/kW per month.
6 Transmission Services pays the \$2,193,000 to Power Services. This cost will be included
7 in the total cost for wind integration that Transmission Services will recover in the Wind
8 Integration - Within-Hour Balancing Service Rate for FY 2009.

9 Q. *Are you planning to adjust any transmission or ancillary service rate to recognize the*
10 *costs of the 25 MW of reserve capacity already being recovered in rates?*

11 A. Yes. Since Transmission Services will now be paying Power Services the total cost for
12 wind integration, the \$2,193,000 should be removed from the transmission revenue
13 requirement. Therefore, BPA plans to post on its Open Access Same-Time Information
14 System (OASIS) a discount to the RFR rate for all of FY 2009. The discount will reduce
15 the RFR rate from 0.33 mills per kilowatthour to 0.28 mills per kilowatthour to obtain the
16 \$2,193,000 reduction in RFR revenue. The RFR revenue forecast for FY 2009 is
17 \$14,900,000. Transmission Services will reduce the RFR rate to obtain a \$2,193,000
18 reduction in RFR revenue. Thus, the discounted RFR rate is estimated to be (0.33 mills
19 per kWh) $((\$14,900,000 - \$2,193,000)/\$14,900,000) = 0.28$ mills per kWh.

20 Q. *Does this conclude your testimony?*

21 A. Yes.

ATTACHMENT A

ACS-09

ANCILLARY SERVICES AND CONTROL AREA SERVICES RATE

SECTION I. AVAILABILITY

* * *

Control Area Service rates available under this rate schedule are:

* * *

5. Wind Integration –Within-Hour Balancing Service

* * *

SECTION III. CONTROL AREA SERVICE RATES

E. WIND INTEGRATION - WITHIN-HOUR BALANCING SERVICE

The rate below applies to all wind plants in the BPA Control Area. Within-Hour Balancing Service provides the generation capability to follow within-hour variations of wind resources in the BPA Control Area and to maintain the power system frequency at 60 Hz in conformance with NERC and WECC reliability standards.

1. RATE

The rate shall not exceed \$0.81 per kilowatt per month.

2. BILLING FACTOR

The Billing Factor is as follows:

- i. For each wind plant, or phase of a wind plant, that has completed installation of all units no later than the 15th day of the month prior to the billing month, the billing factor will be the nameplate of the plant in kW. A unit has completed installation when it has generated and delivered power to the BPA system.

ATTACHMENT A

ii. For each wind plant, or phase of a wind plant, for which some but not all units have been installed by the 15th day of the month prior to the billing month, the billing factor will be the maximum measured hourly output of the plant through the 15th day of the prior month in kW.

Attachment B
Wind Integration Within-Hour Balancing Service
Rate Calculation

(A)	(B)	(C)	(D)	(E)	(F)
Period	Duration	Monthly Installed Wind Capacity ^{1/}	Revenue Requirement ^{2/}	Billing Factor	Rate
	(months)	(kW)	(\$)	(Col B * Col C) (kW)	(Col D/Col E) (\$per kW per month)
Oct 08 - Jul 09	10	2,237,000		22,370,000	
Aug 09 - Sep 09	2	2,877,000		5,754,000	
FY 2009	12		\$22,867,842	28,124,000	\$0.81

1/ See McManus and Enyeart, WI-09-E-BPA-02.

2/ See Bermejo, et al., WI-09-E-BPA-03.