UNITED STATES OF AMERICA
U.S. DEPARTMENT OF ENERGY
BEFORE THE
BONNEVILLE POWER ADMINISTRATION

2010 Wholesale Power and Transmission	)	Docket No. BPA-10
Rate Adjustment Proceeding	)	WP-10
	)	TR-10

REBUTTAL TESTIMONY
OF
COWLITZ COUNTY PUD

WITNESSES:

BRIAN L. SKEAHAN
ROBERT J. ESSEX

SUBJECT OF TESTIMONY:

In WP-10: Costs Allocated to Wind Integration – Within-Hour Balancing Service

In TR-10: Rate Design

April 17, 2008

WP-10-E-CO-01
TR-10-E-CO-01

TABLE OF CONTENTS

TESTIMONY OF:

BRIAN L. SKEAHAN
ROBERT J. ESSEX

WITNESS FOR:

COWLITZ COUNTY PUD

SUBJECT:

In WP-10: Costs Allocated to Wind Integration – Within-Hour Balancing Service

In TR-10: Rate Design

Page

TESTIMONY OF

BRIAN L. SKEAHAN & ROBERT J. ESSEX

Witnesses for Cowlitz County PUD

SUBJECT: In WP-10: Costs Allocated to Wind Integration – Within-Hour Balancing Service

In TR-10: Rate Design

Section 1: Introduction and Purpose of Testimony.

Q. *Please state your name and your qualifications to provide this testimony.*

A. My name is Brian L. Skeahan. My qualifications are stated in WP-10-Q-CO-01. My name is Robert J. Essex. My qualifications are stated in WP-10-Q-CO-02.

Q. *On whose behalf are you offering this testimony?*

A. We are testifying on behalf of Public Utility District No. 1 of Cowlitz County, Washington (Cowlitz PUD).

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

A. BPA's current Wind Integration - Within–Hour Balancing Service rate of $0.68 per kilowatt per month was developed in a settlement in BPA's WI-09 rate proceeding. As part of that settlement, BPA committed to develop a consistent cost allocation methodology for allocating the costs of within-hour regulating reserves to provide load regulation, load following, generation regulation and generation following based on demonstrable criteria. In this testimony we will use the term "following reserves" to refer to all of the reserves to achieve within-hour balancing. BPA's Initial Proposal in this case describes the methodology BPA proposes to use to allocate the cost of providing within-hour reserves. Several parties filed direct cases both critical and supportive of BPA's proposed Wind Integration Within-Hour Balancing Service (WI) rate and the methodology and assumptions used to develop it. The purpose of this testimony is to address those criticisms and to suggest how BPA might respond to them.

Q. *How is your testimony organized?*

A. This section 1 and the following section 2 address introductory and general matters and they relate to both the WP-10 and TR-10 sub dockets. Section 3, 4 and 5 address various issues relating to the cost of generation inputs allocated to BPA's Transmission Services as described in the Generation Inputs Study and Documentation (WP-10-E-BPA-08) and the supporting testimony. As such, those sections relate primarily to the WP-10 docket. Section 6 addresses exclusively transmission rate design issues and therefore relates exclusively to the TR-10 docket.

Section 2: Cowlitz PUD's Interest in the Wind Integration Rate.

Q. *Does Cowlitz PUD have a financial interest in the WI rate?*

A. Yes. Cowlitz PUD is one of BPA's larger power customers. BPA's latest draft forecast estimates that Cowlitz PUD will purchase approximately 519 aMW of power from BPA during the rate period. This represents about 7.3% of BPA's forecast Priority Firm power sales. Cowlitz PUD will receive the benefit of any allocation of fixed generation costs to the WI rate by a reduction in its power bills. Cowlitz PUD also has an interest as the beneficial owner of existing and planned wind generation. Cowlitz PUD's share of the Nine Canyon, White Creek and Harvest Wind facilities represents about 3.4% of the average amount of wind capacity BPA forecasts will be installed within its Balancing Authority Area (BAA) during the rate period. Therefore, Cowlitz PUD will pay the WI rate in its role of wind generation owner.

Q. *Do these financial interests offset each other?*

A. Only partially. Cowlitz PUD represents a much larger share of BPA's firm power sales than it does of BPA's WI billing determinants. That means that Cowlitz PUD will receive a larger credit towards its power bill through the charge to Transmission Services (TS) for the generation inputs to provide the WI service than it will pay in WI charges. However, Cowlitz PUD's real interests are that BPA adopt principled cost-based rates to

avoid inappropriate subsidies and improper price signals. The decisions BPA makes in this case are likely to influence rates for many years, so the use of sound principles is more important to Cowlitz PUD than its short-term financial benefit. Based on our review of the testimony, some parties appear to have allowed their immediate financial interest to override their purported endorsement of equitable cost based rates

Section 3: Generation Reserve Forecast.

Q. *Do you agree with BPA's forecast of its following reserve requirements?*

A. In this context, and throughout the testimony, we will use the general term "following reserves" to mean the reserves needed to reliably provide within-hour balancing for load and generation. As a general proposition, BPA's methodology for forecasting following reserve requirements appears to be reasonable. However, BPA's forecasting methodology differs significantly from the methodology BPA used in the WI-09 rate case, and the methodology relies heavily on only 21-months of data. WP-10-E-BPA-23 pp 5-6. One should always be cautious when using a methodology for which its forecasting accuracy has never been tested, particularly when the time series on which the methodology is based is relatively short. Based on our review of BPA's forecast, it appears that BPA has overstated the need for following reserves for within-hour balancing for wind generation.

Q. *Why do you believe that BPA has overstated its following reserve requirements for within-hour balancing for wind generation?*

A. There are three reasons to think that BPA has overstated its WI reserve needs. First, BPA's reserve forecast is based on BPA's July 15, 2008 estimate of timing of the interconnection of future wind projects. Second, BPA's scaling methodology is based on an improbably high assumption regarding the correlation of when wind projects ramp up or down in generation. Third, BPA's forecast is based on historical scheduling accuracy that is unlikely to be representative of the future.

Section 3.1: Forecast of Future Wind Projects.

Q. *Please explain why a reserve forecast based on BPA's July 2008 estimate of the timing of the interconnection of future wind projects is likely to overstate WI following reserve requirements?*

A. BPA describes in its testimony (WP-10-E-BPA-23) and its Generation Inputs Study (WP-10-E-BPA-08) how it estimates which future wind projects will be online during the rate period by reviewing the pending requests in BPA's interconnection queue. The procedures described by BPA seen quite reasonable. However, there is a substantial lag between the timing of the estimate BPA used to prepare its initial proposal, that is the estimate from July 15, 2008, and the beginning of the rate period on October 1, 2009. A lag of this magnitude might be acceptable if there were a long and robust history of wind development in the Pacific Northwest and current circumstances were typical and constant. However, the history of wind development in the Pacific Northwest is relatively short with the majority of wind capacity coming online within the past two years. *See* WP-10-E-BPA-08 p 26. This short history would make extrapolation from the past somewhat unreliable under the best of circumstances. As Iberdrola correctly points out, several factors have changed since BPA developed its forecast of the amount of installed wind capacity in its BAA during the rate period. *See* WP-10-E-IR-01 p 25. BPA should update its forecast of installed capacity to take into account all known changes in the schedules for projects in its interconnection queue and any known plan for existing projects to be removed from BPA's BAA. In addition, BPA should estimate the effect of the current economic downturn and the resultant difficulties in accessing capital on the pace at which developers complete and energize wind projects.

Q. *What would you expect the results of this updated forecast to be?*

A. We are not privy to the information BPA uses to make its forecast of which and when future wind projects are likely to connect to BPA's transmission system. However, we

agree with Iberdrola that developments subsequent to July 15, 2008 will almost certainly result in less installed wind capacity during the rate period than is contained in BPA's forecast. To the extent the current forecast of future installed capacity is high, the cost of generation inputs allocated to the WI rate will also be high.

Q. *How would an unduly high forecast of installed wind capacity affect the WI rate?*

A. BPA estimates that the amount of following reserves needed to support each megawatt of wind generating capacity increases as the amount of installed wind capacity increases. As a result, the cost of generating inputs allocated to WI service increases more steeply than do the billing determinants over which those cost are assumed to be recovered. One consequence of this non-linear relationship is that, if BPA forecast too much installed wind capacity, the WI rate will be higher than it would be if BPA correctly forecast future installed capacity. Moreover, when the billing determinant associated with the excessive wind capacity fail to materialize, TS will not be able to recover the total cost of generation inputs allocated to WI service.

Section 3.2: BPA's Scaling Methodology.

Q. *Have you reviewed the methodology BPA used to "scale" in future wind facilities?*

A. Yes. We reviewed BPA's "Generation Inputs Study and Study Documentation" (WP-10-E-BPA-08) as well as the testimony of Messrs. McManus *et al*., (WP-10-E-BPA-23). We also reviewed the critiques of BPA's scaling methodology contained in the testimony of Mr. Dragoon on behalf of the Northwest Wind Group (WP-10-E-NG-01) and Messrs. Froese *et al*. on behalf of Iberdrola (WP-10-E-IR-01).

Q. *What conclusions did you draw from this review?*

A. BPA's scaling methodology assumes that the timing and the amount of wind at future projected wind facilities is a direct function of the timing and amount of wind at other, existing wind facilities. This assumption that there is a constant, unvarying correlation in the amount and timing of wind at different sites is not consistent with observable wind

patterns. BPA's witnesses recognize that wind patterns are not unvarying by noting that weather data "typically" (but not always) reflect a west to east pattern assumed in their study. *See* WP-10-E-BPA-23 p 12. Messrs. Froese *et al*. describe Iberdrola's own analysis of the correlation of wind ramps among wind facilities and conclude that there is no fixed lag or lead among the various wind farms. *See* WP-10-E-IR-01 pp 21-24.

Q. *Are you surprised by the results of Iberdrola's analysis?*

A. No. BPA's assumption of an unvarying correlation in the wind at various sites is far too simple for anything as complex as weather. We agree with Iberdrola that BPA needs a much more robust method to forecast the effect of future wind facilities on following reserve requirements. There are large amounts of data and studies available to guide BPA in developing a new, realistic scaling methodology. The desirability of a realistic forecasting methodology using available data was highlighted in an article in the November/December issue of IEEE Power and Energy:

> "The 2005 IEEE Power and Energy Magazine wind integration article discussed the emerging use of sophisticated atmospheric (meso-scale numerical weather prediction) models to develop credible wind power time series for use in the integration analysis. Since that time, this trend has continued and is now generally accepted that integration studies should use this type of data, synchronized with load data, if actual data are not available. This becomes critical as more wind is added to the system because the wind plant output is a function of the individual wind turbines, each of which sees a different wind speed at the same moment."

This quote from a 2007 article refers to a previous 2005 article in the same magazine on the same topic, which discusses the use of meso-scale forecasting. It points out that such forecasting has been around for a number

of years, is generally accepted for use to analyze wind integration by the industry, and its use is "critical" as more wind is added to the system.

Q. *Is it feasible for BPA to develop such a new methodology for this rate case?*

A. Probably not. Even if BPA were able to develop a realistic forecasting methodology, the procedural requirement of § 7(i) might foreclose its implementation in this rate case. However, BPA should at a minimum adjust the results of its scaling to compensate for the overly simple assumption regarding site correlations.

Q. *How would BPA make such an adjustment?*

A. According to Mr. Dragoon, BPA checked how well its scaling methodology accurately projects the output of certain existing wind facilities from the output of other wind facilities and reported that this check overestimated the need for reserves from 5 percent to more than 20 percent. *See* WP-10-E-NG-01 p 8. BPA should perform a detailed analysis of how well its scaling methodology projects the actual output of all existing wind facilities in its BAA, and adjust its following reserve forecast by whatever error factor BPA calculates.

Q. *Would this process eliminate the need to develop a more robust scaling methodology?*

A. No. Our recommendation for this rate case simply recognizes the time constraints of this rate case. BPA should develop the more robust and realistic model for future cases and not rely on the approximation we recommend here for this case only.

Section 3.3: Future Wind Schedule Accuracy.

Q. *Are there other aspects of BPA's forecast of following reserve requirements with which you disagree?*

A. Yes. BPA assumed that future wind schedules would be no more accurate than the schedules submitted from 14 wind projects from August 1, 2007, to August 1, 2008. Based on its analysis of scheduling and generation data from this period, BPA concluded that schedules consistently lagged actual generation values and that a two-hour lag time

produced high correlation coefficients between actual schedules and actual generation. Therefore, BPA based its forecast of following reserve requirements on the assumption that the accuracy of future wind schedules could be reasonably approximated using a two hour persistence model. *See* WP-10-E-BPA-23. We do not believe it is reasonable to assume that scheduling accuracy will not improve for the upcoming rate period.

Q. *Why should BPA assume that scheduling accuracy will improve for the up-coming rate period?*

A. First, the technology and knowledge exists to improve scheduling accuracy substantially over the scheduling accuracy during August 2007 to August 2008 period. Second, BPA's rate and other proposals provide substantial economic incentive for wind project operators to adopt this technology and to improve their forecasting accuracy.

Q. *Please explain what you refer to regarding the technology and data available to improve wind schedule accuracy?*

A. In the testimony of Messrs. Froese *et al.*, Iberdrola described ongoing developments in data collection and assessment that have a significant bearing on the ability of wind operators to improve their scheduling accuracy. WP-10-E-IR-01 pp 26-33. Iberdrola also calculated the actual forecast accuracies it has been able to achieve using the enhanced data collection and evaluation techniques currently available. These data submitted by Iberdrola demonstrate that substantial improvements in scheduling accuracy are possible using available technology. Iberdrola's conclusions are consistent with a growing body of literature on the subject, such as the IEEE magazine articles cited above. Owners/operators of wind generation, in conjunction with NOAA and the national labs, have made significant advances in wind forecasting capabilities. Application of these capabilities in other areas of the country has demonstrated the ability to do better than two hour persistence. With the proper incentives, it is reasonable to expect these "best practices" to be widely adopted in the BPA BAA.

Q. *Is it appropriate to assume wind project operators will utilize the available forecasting tools to improve their forecasting accuracies during the upcoming rate period?*

A. Yes. That is our second point above. It will cost wind operators money to implement and utilize the available tools. BPA's current transmission rates have only marginal financial incentives for wind operators to improve their forecasting accuracy. However, the financial incentive to improve forecasting accuracy during the upcoming rate period will be significantly greater. Therefore it is reasonable to expect that wind operators will acquire and utilize the information and techniques available to improve their forecasting accuracy just as Iberdrola has been doing.

Q. *What are the new financial incentives you refer to?*

A. There are two very direct incentives and one more indirect incentive. The first of the direct incentives is the set of proposals developed by BPA's Wind Integration Team (WIT) that are described in a March 5, 2009 paper entitled *Connecting Variable Generation Resources to the Federal Columbia River Transmission System* (FCRTS). A copy of that paper is attachment 2 to the testimony WP-10-E-JP6-1. We will refer to BPA's proposal as the "proposed DSO".

BPA briefly summarizes the impact of the proposed DSO on system reliability in WP-10-E-BPA-22 at pp 20-22. As BPA notes, one of the purposes of the proposed DSO is "to incentivize more accurate wind forecasting". *Id*. at 20. Whenever BPA has deployed 90 percent of the reserve held for balancing, the proposed DSO would allow BPA: i) in the event of over generation, to curtail a wind project's output to the amount of scheduled power plus the project's proportional share of reserves for the hour or; ii) in the event of under generation, to curtail the transmission schedules (E-tags) for each wind project for the balance of hour to the amount of actual generation plus the project's proportional share of the balancing reserve for generation. Any such curtailment would have adverse financial effects on the project's beneficial owners.

Q. *What is the first financial incentive you envision?*

A. In the event of the need to curtail generation during over generation events, the project owner would lose the market value of the power not generated and the value of the green tags and production tax credits that would have been available had the curtailment not have been required. In the event of the need to curtail transmission schedules in the event of under generation, the project owner may be unable to meet the contractual expectations of its PPA counter-party. The project owner could be subject to penalties under its PPA, and the possibility, magnitude and frequency of such curtailments would have a bearing on the price the project owner could expect its counter-party to pay it for power. A wind operator would have a very strong incentive to avoid any situation in which its schedules would be curtailed. The most direct means to avoid orders to curtail generation or to be subject to curtailed schedules would be to submit schedules within the accuracy forecast used by BPA to set its within-hour balancing reserve requirement.

Q. *What is the second of the direct financial incentives you alluded to?*

A. In the TR-10 docket, BPA has proposed revision to the Intentional Deviation provision of the Generation Imbalance Service rate schedule. We will address the specifics of the BPA TS proposal in a later section of this testimony addressing the TR-10 docket. Here we address only the effect on scheduling accuracy that changes to these provisions is likely to cause. In testimony submitted by BPA Power Services (BPS) in TR-10, BPA's witnesses Kitchen *et al*. observed that even if the revised Intentional Deviation standard is only applied infrequently, it will "have the desired effect and all customers will schedule their loads and generation more accurately." TR-10-E-BPS-01 p 8. We agree with BPS that the implementation of new Deviation standards will result in increased forecasting accuracy. As such, it would be unreasonable to base the forecast of generation inputs required to provide following reserves on the historic accuracy.

Q. *What is the indirect financial incentive you alluded to?*

A. In future cases, BPA will again review actual scheduling accuracy, and that accuracy will have a bearing on the costs allocated to WI reserves. To the extent wind operators improve their scheduling accuracy they can reasonably expect future rates to be lower than if they fail to improve scheduling accuracy.

Q. *What level of forecasting accuracy should BPA assume in its forecast?*

A. We believe BPA should develop a reserve forecast based on a 45-minute persistence assumption. We base this on the analysis submitted by Iberdrola and our expectation that the proposed DSO will adequately assure transmission reliability.

Q. *Both Iberdrola and the Northwest Wind Group recommended that BPA develop its following reserve requirement using a 30-minute assumption. Why do you not support that recommendation?*

A. Based on our review of the data submitted by Iberdrola in WP-10-E-IR-01 and attachment C, it appears that Iberdrola has been able to achieve scheduling accuracy between the 45-minute and 30-minute persistent assumption. We believe that Iberdrola may be somewhat ahead of other wind operators in its forecasting techniques. Therefore, we believe that the 45-minute persistence assumption is more reasonable for the upcoming rate period. BPA can revisit this assumption for the rate period to begin in FY 2012 based on actual experience during the next two years and further developments in wind forecasting technology.

Section 4: Allocation of Embedded Costs.

Q. *What is the purpose of this section of your testimony?*

A. This section addresses Northwest Wind Group's suggestion that wind generators only be allocated the cost of incremental following reserves needed above the amount of Load Following Reserves "historically provided for load". WP-10-E-NG-01 p 20. We disagree with this proposal. NW Wind claims that such an allocation is appropriate

because the Incremental Standard Deviation (ISD) method used by BPA to allocate reserve requirements between generation and load is merely an "approximation", where as the test urged by NW Wind is a "precise value". *Id*. It does not matter how precise a number is, if it is the wrong number it should not be used as the allocation factor. It is far better to be approximately right than precisely wrong.

Q. *Are you supporting the use of approximations over precision?*

A. No. We disagree with the underlying rate making philosophy implied in what NW Wind advocates. There is some diversity between the following reserve needed for wind and those needed for load. As a result, the total reserves needed for both wind and load is less than the sum of the reserves for each one taken alone. It is also the case that the incremental reserves needed to serve wind over those historically provided for load, plus the incremental reserve needed for load over and above those needed for wind alone, is less than the total reserve needed. Some amount of reserves can serve both needs because of the diversity of those needs. If the NW Wind proposal were adopted uniformly for both wind and load, that is, if each group were to pay only for the reserves that would be needed in excess of those that are needed for the other group taken alone, then only a portion of the total reserves needed to maintain reliability would be paid for.

BPA's ISD method attempts to forecast the amount of use wind and load will make of the total reserves that must be set aside to serve the both of them. BPA then allocates the cost of the total reserves between the two based on their relative use of those reserves. This method of allocation is perfectly consistent with generally accepted rate making principles even if the particular algorithm used by BPA to estimate the proportional uses may never have been used previously. NW Wind's suggestion to allow wind to be a free rider on the backs of power customers is contrary to such principles. We believe all customers should pay for their proportional use of the system, but not more.

Q. *Has NW Wind demonstrated that the ISD method fails to estimate the proportional use by wind and load with reasonable accuracy?*

A. No. Nothing Mr. Dragoon has said regarding the ISD method suggests that any error supposedly introduced into the forecast by use of that method is material.

Q. *Is there any merit at all to the Northwest Wind Group's contention that BPA has allocated too much of its embedded costs to WI Service?*

A. We believe there are reasons to conclude that BPA has allocated to the WI service a disproportionate share of the embedded cost of the "Big 10" units that are capable of supplying WI reserves to the WI service, but not the reason given by Mr. Dragoon.

Q. *What reason is there to believe BPA allocated excess embedded costs to WI service?*

A. BPA's method to measure the capacity capability of the Big 10 units was based on 1937 water. As a result, BPA took no account of the non-firm uses of those units. WP-10-E-BPA-24 p 4. In fact however, the available capacity of the Big 10 units is used to generate substantial amounts of secondary energy. BPA could have measured all expected uses of the Big 10 units and spread the fixed costs of those units over all such uses. If BPA had done so, using the same revenue requirement in the numerator and including reserve uses, firm power generation uses and secondary marketing uses in the denominator, the unit price for the use of capacity would have been less than the price calculated by BPA. Therefore, the embedded cost allocated to following reserves and the WI portion of the following reserves would be reduced.

Q. *Is it reasonable to allocate a portion of the embedded costs to secondary sales?*

A. It certainly is if BPA intends to include both the embedded cost of the units plus the variable cost of having the units available to provide reserves (as measured primarily by a reduction in the value of BPA's secondary energy) as part of the following reserves revenue requirement. It cannot reasonably be the case that BPA ignores a major use of its system in allocating embedded costs and simultaneously allocates the change in value

of that major use to customers that derive no benefit (in the form of any secondary revenue credit) from that use.

Section 5: Allocation of Variable Costs.

Q. *What is the purpose of this section of your testimony?*

A. In addition to the embedded cost of capacity that BPA forecasts is needed to provide following reserves, BPA also allocates what it calls "variable costs" to the following reserves. Both Iberdrola and the Northwest Wind Group argue that BPA's estimated "variable cost" are duplicative of costs recovered through the Generation Imbalance Services rate and the penalty provisions in the Intentional Deviation proposal. Iberdrola appears to believe that the sum of all the various applicable charges is excessive, and that BPA has underestimated the net revenues it will receive through its Imbalance and Deviation charges. WP-10-E-IR-01 pp 5-8. Iberdrola appears to suggest that revenue from such penalties ought to be refunded through lower rates to wind generators. While we support some of the modifications Iberdrola proposes to BPA's language for Intentional Deviation, we are generally opposed to segregating revenues from the deviation between rate case forecasts for individual items and the subsequent actual events to then target revenues for refund (or surcharges) through individual rates.

With respect to the Northwest Wind Group testimony, we differ with Mr. Dragoon's claim that the Generation Imbalance rate and the allocation of the variable cost of providing following reserves recover the same cost more than once. *See eg.*WP-10-E-WG-01. We also disagree with Mr. Dragoon that allocating both an embedded cost and the variable cost to following reserves is, in all cases, improper "and pricing".

Q. *Why do you oppose allocating penalty charges assessed on some wind generators to offset the rates to other wind generators?*

A. In effect, BPA has forecast that it will receive no net revenues nor incur net costs relating to the "penalty" charges referred to by Iberdrola. If circumstances develop such that

penalty charges are imposed, BPA may also incur related costs it did not forecast. Thus, the net revenues, if any, BPA receives from the penalty charges may be less than the charge itself. Because BPA did not forecast any revenues from the "penalty" charges, there is no cross subsidy to any customer or customer class from the happenstance that a charge may later be incurred. Moreover, inasmuch as BPA set rates to recover costs it forecasts to occur during the rate period, the fact that it may have received some revenues from penalty charges in a prior rate period will not significantly affect future rates. Finally, we can think of no good reason a wind generator should receive an unexpected refund merely because another wind generator was penalized due to its behavior.

Q. *At various points in the NW Wind testimony the witness argues that the variable costs included in BPA's forecast of following reserve costs are charging customers for costs recovered through the Generation Imbalance rate. See* WP-10-E-NG-01 pp 25 and pp 31-32. *Do you agree?*

A. No. Generation Imbalance is a charge for energy delivered. The variable costs that BPA reflects in its Generation Inputs Study reflect primarily the decreased value of secondary energy due to a shift in the timing of generation and, to a much lesser extent, decreased efficiency in the use of generators to generate secondary energy for sale. None of the variable costs duplicate costs recovered through the Imbalance rate.

Q. *NW Wind also argues at* WP-10-E-NG-01 p 24 *that it is inappropriate to charge [allocate] to customers both a proportional share of revenue requirement [embedded costs] based on its use of resources plus the opportunity cost of not deploying the resources to other uses. Do you agree?*

A. Yes, we agree with this principle articulated by NW Wind. It is not appropriate to allocate the embedded cost of facilities plus the opportunity cost of not having the facilities available for alternative uses to the same customers. We do not, however, agree that the embedded cost and variable cost allocated by BPA to following reserves

uniformly violate this principle. The embedded costs BPA allocates to providing Wind Balancing Reserves are based solely on the *inc* capacity needed to support Wind Balancing. BPA forecasts these embedded costs (at the 2-hour persistence assumption) to be approximately $88 million per year. WP-10-E-BPA-08 p 65, Table 3.7. BPA allocates no embedded cost to Wind Balancing based on the *dec* capacity needed to support Wind Balancing. WP-10-E-BPA-08 pp 57-58.

BPA separately estimates the variable cost of providing *inc* capacity to provide Wind Balancing Reserves and the variable cost of *dec* capacity to provide those reserves. BPA estimates this variable cost (at the 2-hour persistence assumption) to be $10.6 million annually for the variable cost of *inc* capacity and $23.6 million annually for the variable cost of *dec* capacity. WP-10-E-BPA-08 p 100, Table 4.19.

In our opinion, allocating both the embedded cost and the variable cost of supplying *inc* capacity to provide Wind Balancing Reserves violates the principle that customers should not be allocated both the cost of the facilities they use *plus* the opportunity cost of not having the full capacity of those facilities available to optimize secondary revenues. This is particularly true given that BPA neither reflects the use of capacity for secondary generation when it measures the per unit price of capacity nor credits any secondary revenue to the Wind Balancing service. The $88 million in embedded cost of *inc* capacity allocated to Wind Balancing Reserves more than compensates for the $10.6 million in reduced efficiency of the system caused by supplying such reserves, and BPA should not include *inc* variable costs in the WI rate.

BPA allocated no embedded cost to Wind Balancing for the use of *dec* capacity. Therefore, it is appropriate to allocate to Wind Balancing Reserves a share of the $23.6 million in variable costs (primarily opportunity cost of shifting generation out of the HLH period into the LLH period) that providing the *dec* reserves entails. Otherwise, wind

operators would use the *dec* capacity for free and impose a $26.6 revenue loss on other customers.

Section 6: Rate Design Issues (for TR-10).

Q. *Do you have any reactions to parties' direct cases regarding rate design issues in the TR-10 rate case?*

A. Yes. The JP6 joint party group has proposed the BPA's TS adopt a $1.00 per kW-month ratchet charge if BPA adopts a Wind Integration rate based on a 45-minute persistence scheduling accuracy. We believe the rationale offered by the JP6 witness panel for such a ratchet charge is misplaced and that the proposed charge is unwarranted. Additionally, several parties have proposed changes to BPA's Intentional Deviation provision, and we believe those proposals have substantial merit.

Section 6.1: The JP6 Misplaced Ratchet Proposal.

Q. *What reasons does the JP6 panel give for recommending that BPA adopt a $1.00 ratchet charge as part of the ASC-10 rate schedule?*

A. The JP6 panel argues that, if BPA bases the Wind Balancing rate on better scheduling accuracy than wind operators have historically met, then there is some chance that the actual level of Within-Hour Wind Balancing reserves that the wind fleet might use could exceed the reserves "set aside for it in the rate case." WP-10-E-JP6-01 p 11. Of course, BPA does not "set aside" any reserves in the rate case; it forecasts the uses of reserves in order to forecast the costs of providing such reserves, to develop rates to recover such costs and to forecast the revenues it will receive from customers. We treated the JP6 testimony as if their concern is that BPA's forecast of the costs of and revenues from providing reserves may differ from the actual costs and revenues.

Q. *Could BPA's forecast of costs and revenues differ form its actual future cost and revenues?*

A. Yes. BPA's costs and its revenues could be higher or lower than what BPA forecasts in the rate case. Indeed, it is more probable than not that not a single forecast made in the rate case will turn out in retrospect to have been precisely right. The potential that events do not materialize precisely as forecast in the rate case is the fundamental reason BPA considers the need to mitigate risks as part of the rate process. Thus, the fact that forecasts could differ from actuals is not an interesting observation by the JP6 panel. The potential magnitude and consequences of the differences between forecasts and actuals are what matters.

Q. *Does the JP6 panel offer any suggestion on how BPA might limit the discrepancy between forecasts and actuals?*

A. No. In fact, the JP6 panel seems to accept that by the rate period the forecasting accuracy of the wind fleet as a whole will likely improve over its historic accuracy (WP-10-E-JP6-01 p 11). They nonetheless recommend that BPA use the two-hour persistence assumption based on historic forecasting accuracy to set the WI component of the ASC-10 rate. They observe that "This rate would be likely to recover all of BPA's cost in providing Wind Integration service." WP-10-E-JP6-01 p 19. They seem to justify this based on two arguments: i) that BPA will not know with certainty the precise degree to which wind scheduling accuracy will improve; and ii), that implementing the DSO could cost wind operators money so BPA may choose to discontinue implementation of the DSO. WP-10-E-JP6-01 pp 10-19.

Q. *Are the expressed concerns of the JP6 panel reasonable?*

A. No. The fact that BPA cannot know the future with precision is not a valid basis for refusing to make a reasonable estimate. The JP6 panel seems to argue that BPA should set the Wind Balancing rate high enough to assure that, no matter what, it will recover no less than the costs. The JP6 panel seems entirely indifferent to the possibility that such a proposal might recover far more than the costs. BPA should not heed such advice.

Instead, BPA should set its rates to recover its best estimate of what the cost of service will be. BPA should not bias its rates to favor some customers over others.

Q. *Are you concerned, as the JP6 panel purports to be, that BPA will be inclined to fail to implement the DSO if its operation actually results in curtailments?*

A. No. There is no basis for this speculation. We do not believe that BPA has any history of refusing to implement its business practices for the purpose of financially benefiting one class of customers at the expense of other classes.

Q. *Is there any reason to believe that basing the Wind Balancing rate on the two-hour persistence assumption is necessary to hold power customers financially harmless from the fact that BPA provides Wind Balancing services?*

A. No. Most of the costs included in the Wind Balancing rate are the embedded cost of capacity, and this is true regardless of which persistence assumption BPA adopts. The embedded cost that BPA would allocate to Wind Balancing at the lowest persistence assumption, that is 30 minutes, exceeds BPA's forecast of the variable costs at the highest, two-hour persistence assumption. These embedded costs that BPA allocates to the Wind Balancing service are costs that power customers would have had to pay if BPA were not providing the Wind Balancing service. Therefore, power customers benefit from the fact that BPA sells this service to wind operators. The real issue is the fair allocation of costs, not minimizing rates to one customer class by overcharging another class.

Q. *Are you concerned by the JP6 panel's claim at* WP-10-E-JP6-01 p 17 *that, if the wind fleet actually uses more reserves than BPA forecasts or if BPA chooses not to enforce the DSO, then some "additional cost" of balancing reserves would be an unrecovered cost of the FCRPS and reduce PS financial reserves?*

A. The argument that BPA will choose not to implement a DSO that it adopted for the purpose of system reliability is unwarranted, and even more so if the consequences were

any significant adverse effect on BPA's financial position. The possibility that the wind fleet would use "more reserve than set aside for the total system reserve requirement" would require that BPA not implement the DSO after adopting it. The whole argument that BPA's financial integrity depends on an excessive Wind Balancing rate is silly.

Q. *Earlier you stated that the JP6 panel's $1.00 ratchet charge is unwarranted. Please explain what you mean.*

A. The charge is unwarranted because there is no good reason for creating such a charge for the reasons stated above. In addition, the very structure of the charge is seriously flawed.

Q. *How is the ratchet flawed?*

A. The first circumstance that the JP6 panel asserts should trigger the ratchet is if the DSO or a successor DSO were to be set aside. If the DSO were set aside, raising the rates to wind generators is not the solution. BPA proposes to adopt the DSO to maintain system reliability. If the DSO were to be set aside or it could not be enforced as written, then the solution would be to revise the DSO to correct the flaws in it.

The JP6 panel also argues that a $1 per MW-month ratchet should be applied to each wind plant that fails to meet the average forecasting accuracy assumed by BPA in the rate case. This suggestion ignores the fact that an average is just that, an average of higher and lower numbers. That any one plant might deviate from the average, either higher or lower, implies nothing about the cost of reserves. Indeed, some wind operators can be above average only if other operators are below average. Thus, if a ratchet were appropriate and anyone should benefit from its revenues, it should be the better wind forecasters that benefit, not power customers. However, do not believe any ratchet charge is appropriate. BPA should treat the Wind Balancing rate like all other rates. BPA should establish the rate based on the best information available to it.

The JP6 suggestion that the Wind Balancing rate should be subject to some unique, adverse treatment says more about their hostility to wind generation than about the merits of their proposal.

Section 6.2: Intentional Deviations.

Q. *Have you reviewed the revisions BPA proposed for the Intentional Deviation language in the Generation Imbalance rate and the parties' testimony reacting to those revisions?*

A. Yes. The revisions to the language are such that the Intentional Deviation penalty can be applied under circumstances that no intentional (as that term is normally defined) deviation occurs at all. We do not take issue with the appropriateness of penalty charges for a customer's intentional failure to abide by the rules. However, we believe that both Iberdrola and the Northwest Wind group make a very good point regarding the proliferation of charges that BPA proposes to apply to unintentional deviations from planned operations. An Intentional Deviation penalty should not be included in that list. The costs associated with unintentional deviation should be recovered through cost-based rates not through above-cost penalty charges.

Q. *Do you accept the argument of the BPA PS panel that the Intentional Deviation standard is designed to act as a deterrent and will encourage customers to schedule their loads and generation more accurately?*

A. Threatened penalties will deter intentional acts, but they cannot deter unintentional acts. BPA should only apply Intentional Deviation penalty charges to intentional deviations.

Q. *How can BPA limit the application of the Intentional Deviation penalty charge to intentional deviations only and still achieve its objective to deter certain behavior?*

A. Both PNGC (in TR-10-E-PN-01) and Iberdrola (in TR-10-E-IR-01) recommend that BPA differentiate between what they call a Persistent Deviations and Intentional Deviations. If an event that met the definition of a Persistent Deviation occurs, then they recommend that, after discussions with the customer, BPA would determine whether the Persistent

Deviation was also an Intentional Deviation. BPA should be required to consider what steps, if any, the customer took to minimize deviations and/or to mitigate the magnitude and duration of the deviation that did occur.

We support this approach. First, it avoids mislabeling unintentional deviations as Intentional Deviations. Second, it minimizes the likelihood that BPA will be imposing above-cost penalty charges for unintentional behavior. Third, we believe the process of investigating and evaluating the customer's behavior will help achieve the effect of encouraging customers to adopt better practices.

Q. *Does this conclude your testimony?*

A. Yes.