2010 Wholesale Power Rate Case Initial Proposal

REBUTTAL TESTIMONY

POLICY REBUTTAL REGARDING PROPOSED WIND BALANCING RATES

April 2009

WP-10-E-BPA-41

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ELLIOT E. MAINZER, LAWRENCE E. KITCHEN, KIERAN P. CONNOLLY,

RAYMOND D. BLIVEN, and SARAH K. BERMEJO

Witnesses for Bonneville Power Administration

SUBJECT: POLICY REBUTTAL REGARDING PROPOSED WIND BALANCING RATES

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Section 1: Introduction and Purpose of Testimony

Q. Please state your names and qualifications.

A. My name is Elliot E. Mainzer, and my qualifications are contained in WP-10-Q-BPA-40.

A. My name is Lawrence E. Kitchen, and my qualifications are contained in WP-10-Q-BPA-33.

A. My name is Kieran P. Connolly, and my qualifications are contained in WP-10-Q-BPA-12.

A. My name is Raymond D. Bliven, and my qualifications are contained in WP-10-Q-BPA-06.

A. My name is Sarah K. Bermejo, and my qualifications are contained in WP-10-Q-BPA-65. I am not sponsoring the portions of this rebuttal testimony on the Intentional Deviation Penalty, because I have sponsored testimony on that issue in TR-10-E-BPA-07 and TR-10-E-BPA-10.

Q. What is the purpose of your rebuttal testimony?

A. The purpose of our rebuttal testimony is to respond to issues regarding the proposed wind balancing rate raised in parties' direct cases.

Q. How is your testimony organized?

A. Our testimony contains seven sections. Section 1 is this introduction. Section 2 addresses general policy direction for establishing the wind balancing rate. Section 3 focuses on the policy justification for the various rates and charges that affect wind generators. Section 4 rebuts parties' direct testimony concerning BPA's pricing proposal for wind balancing generation inputs. Section 5 discusses the sufficiency of reserves provided from the FCRPS. Section 6 focuses on the rate implications of Dispatch Standing Order (DSO 216) and the determination of the appropriate persistence forecast accuracy. Section 7 discusses cost shift arguments raised by various parties.

Section 2: General Policy Direction for Establishing Wind Balancing Rate

Q. Have you read the parties' direct testimony regarding the generation inputs for the proposed wind balancing rate?

A. Yes, we have.

Q. Please describe in general terms the positions taken by the various parties.

A. Generally, public power parties support the Initial Proposal for allocating costs to wind generators. *See* Baker *et al.*, WP-10-E-JP6-01; Carr and Stratman, WP-10-E-NR-01; and Miles, WP-10-E-SN-02. They raise concerns about the potential for cost shifts if BPA does not properly allocate the cost of integrating large amounts of wind on its system. With specific protections in place, the joint public direct testimony supports the use of a 45-minute persistence forecast accuracy for establishing the amount of reserves BPA will forecast for the rate period. Baker *et al.*, WP-10-E-JP6-01, at 19-22. Without these protections, however, public power advocates for the 2-hour persistence forecast accuracy described in BPA's Initial Proposal.

The wind generation parties oppose most aspects of the generation inputs for wind balancing reserves Initial Proposal. *See* Froese *et al.*, WP-10-E-IR-01; Dragoon, WP-10-E-NG-01; Shimshak and Gramlich, WP-10-E-NG-02; and Arthur, WP-10-E-MS-04(E1). These parties challenge the methodology used to determine the generation reserve forecast. The wind generation parties also object to the pricing approach taken in the Initial Proposal and advocate for the use of a 30-minute persistence forecast accuracy.

The IOUs did not present any direct testimony on the generation inputs issues.

Q. *PPC et al. (JP6) states that wind generation is a variable resource that requires the provision of balancing reserves to ensure that generation is delivered in accordance with the schedule. Baker et al., WP-10-E-JP6-01, at 8. According to JP6, the costs of these balancing reserves are part of the cost of delivery of wind energy and so should be borne by the wind plant owners or wind energy purchasers. Id. Do you agree with the JP6 contention that the rigorous application of the cost-causation principle of ratemaking is key to fair and non-discriminatory power and transmission rates?*

A. Yes. Our fundamental pricing principle is to apply cost causation to all firm uses of the system. Integration of a variable resource requires the provision of within-hour balancing reserves. This service and the other services using generation inputs are a required firm use of the system and require a portion of the firm capability of the FCRPS to be dedicated to that use. We believe that the principle of cost causation requires the embedded costs of the system to be allocated to the firm uses of the system. Our Initial Proposal allocated these costs on a proportionate basis to all the firm uses of the FCRPS. In addition, the operation of the FCRPS to provide within-hour balancing reserves reduces the total quantity and timing of energy available for secondary energy marketing. Secondary revenues are not part of the revenue requirement for the purpose of calculating BPA's embedded costs. They are credited back to BPA's preference customers and have

an impact on preference customers' rates. As a result, we believe that these additional variable costs associated with changes in the fuel supply of the FCRPS should be allocated to the provision of generation inputs.

Q. *Do you agree with the Northwest Wind Group's (NWG) characterization that, historically, BPA has implemented some very progressive policies related to renewable energy and has been a national leader in promoting renewable energy. Shimshak and Gramlich, WP-10-E-NG-02, at 2.*

A. Yes, we agree that BPA has been and continues to be a national leader in promoting renewable energy. BPA has been a leader in supporting the development of renewable energy, especially wind energy, since the 1980s, when we pilot tested early wind turbine designs and helped establish wind monitoring centers to gather data that would eventually aid in wind project development throughout the region. In 1999, BPA interconnected the region's first wind project. In 2001, we exempted wind projects from the third band of our generation imbalance service rate, which eliminated a source of commercial uncertainty and stimulated a rapid increase in wind generation over the following years. In 2004, BPA began offering a suite of wind integration services to help utilities manage the hour-to-hour variability of wind energy.

In 2007, BPA and the Northwest Power and Conservation Council completed an Action Plan for Wind Integration in the Northwest, which determined that adding 6,000 MW to the Northwest power system by 2020 is technically feasible. The Action Plan also established a blueprint for cost-effective wind integration over the next 20 years. Although there is more work to do, BPA and the region have made substantial progress on 10 of the Action Plan's 16 recommendations.

In 2007, BPA Transmission Services conducted its first Network Open Season. This innovative queue management and planning process resulted in 3,700 MW of new

transmission service offers to wind energy projects, and BPA has now undertaken financing and construction of the John Day - McNary transmission line, a critical piece of BPA's transmission system linking the windy Columbia River Gorge to load centers across the west. As a result of the Network Open Season, BPA has also begun permitting on three other lines that will reinforce the transmission system to accommodate wind energy.

In addition to BPA's Network Open Season, in March 2009, BPA began offering Conditional Firm transmission service for up to 1,200 MW of new service requests. BPA is now the largest provider of Long-Term Conditional Firm Transmission Service in the nation, and is the only provider of a Conditional Firm Network Integration Transmission Service product in the nation.

In 2009, facing another doubling of the amount of wind energy in BPA's system, the BPA Wind Integration Team (WIT) developed a set of operating protocols that will allow BPA to continue signing interconnection agreements while protecting the reliability of the BPA system during extreme changes in wind output that were not forecast. These operating protocols will be formalized in a DSO 216. BPA expects these operating protocols to facilitate the interconnection of an additional 2,000 MW of new wind generation into BPA's system over the next two years.

In addition to facilitating the development of wind energy in the Northwest, BPA Power Services directly acquired the output of 248 MW of wind energy from several Northwest wind projects. Finally, BPA Transmission Services has financed the construction of five new substations and six tap lines for wind projects.

Although BPA has achieved many wind integration milestones, BPA continues to improve its ability to support renewable energy. The BPA WIT has recently been reinforced with five additional BPA staff members. Through the WIT, BPA is actively

working to conduct a pilot project for third-party supply of generation inputs and is exploring implementation of sub-hourly transmission scheduling, both of which will aid development of wind generation in the region.

Q. NWG claims that BPA does not provide adequate cost justification for the proposed charges on wind generators, which would result in an over-recovery of its costs related to wind balancing. Shimshak and Gramlich, WP-10-E-NG-02, at 3-4. Please respond.

A. We disagree with NWG's assertion. The Initial Proposal documented the basis for the forecast amounts of within-hour balancing reserves and each of the costs we propose to allocate to the Wind Balancing Service. *See* Generation Inputs Study (Study), WP-10-E-BPA-08; McManus *et al.*, WP-10-E-BPA-23; Klippstein *et al.*, WP-10-E-BPA-24; and Bermejo and Beale, WP-10-E-BPA-25. NWG compares the proposed rate to the rate for Wind Balancing Service that BPA established in FY 2009, but without acknowledging that the majority of costs in the proposed rate cover the costs of within-hour balancing reserves required because of the inability or failure of wind resources to schedule accurately. This aspect of within-hour balancing reserves *(i.e.*, the inability or failure of wind resources to schedule accurately) was excluded from the rate for Wind Balancing Service that BPA established in FY 2009.

Q. Did the costs attributed to the inability or failure of wind resources to schedule accurately exist during FY 2009?

A. Yes. BPA knew that there were within-hour balancing reserve costs associated with the inability or failure of wind resources to schedule accurately in FY 2009, but BPA had not yet determined a method to estimate the amount of these costs. In the WI-09 rate case, BPA elected to proceed with a rate for Wind Balancing Service without including these costs, because BPA believed it was important for developers and purchasers to begin to

understand the costs that development of wind in the BPA Balancing Authority Area (BAA) was placing on BPA.

Q. NWG recommends that BPA adopt an appropriate cost-based rate for Wind Balancing Service that is no higher than the amount necessary to hold BPA's native load customers harmless for the additional use of the Federal hydro system. Shimshak and Gramlich, WP-10-E-NG-02, at 10. Do you agree?

A. No. The NWG's proposal that the rate for Wind Balancing Service be no higher than the amount necessary to hold BPA's native load customers harmless, essentially an incremental rate, would violate the principle of cost causation. NWG quantified this amount as a portion of the variable costs presented in the Initial Proposal. *See* Dragoon, WP-10-E-NG-01, at 28. Such a rate would not meet the standard of cost causation, because it would have BPA's native load customers pay all the embedded costs of the FCRPS, while the wind generators would be responsible for only some of the incremental costs they impose on the system. The Initial Proposal is based on the cost causation principle that all users of the system should pay their fair share of the system's embedded and variable costs.

In addition, NWG assumes that the wind generators' use of the system does not have to be replaced when a portion of BPA's customers provide generation inputs from their share of a Slice of the system in exchange for their share of the cost of generation inputs revenues. These customers must go to the market to replace the capability that is used to provide within-hour balancing reserves. *See* Miles, WP-10-E-SN-02, at 3-4. BPA's forecast of variable costs does not hold these particular customers harmless.

Q. Iberdrola states that BPA's proposal serves to improperly subsidize power rates, shifts virtually all of the risk from BPA to wind generators, and seeks to ensure BPA that all

possible outcomes associated with variability of wind are covered by wind generators, sometimes several times over. Froese et al., WP-10-E-IR-01, at 36. Do you agree?

A. No. We disagree with these assertions. Application of the cost causation principle and recovery of certain variable operating costs from the provision of generation inputs result in a reasonable allocation of the embedded costs of portions of the FCRPS and mitigate impacts on BPA's preference customers from reduction in the value of secondary energy. Risks are allocated consistent with these cost causation principles, in that those entities that are creating the risks *(e.g.*, increased variability and uncertainty) are allocated the costs of managing those risks.

Additionally, the Initial Proposal is not designed to ensure that all possible outcomes associated with the variability of wind generators are covered several times over. The Initial Proposal charges for the capacity and energy impacts associated with providing regulation, following, and imbalance; recovers for energy provided or stored through the Generation Imbalance rate; and places a safeguard mechanism in place to prevent intentional or persistent deviations from schedules that can be avoided by the parties if they engage in sound forecasting and scheduling practices.

Q. MSR claims that BPA's Initial Proposal is based on hypothetical costs rather than verifiable costs and/or verifiable lost revenues. Arthur, WP-10-E-MS-04(E1), at 5-6. MSR cites a BPA data response that indicates that there is no organized capacity market in the Pacific Northwest, in contrast to other regions of the country and, therefore, there is no evidence that BPA could have sold the capacity that is reserved for wind integration. Id. Please respond.

A. The lack of an organized market does not mean that there are no opportunities to sell capacity; rather, it means that there is no transparent pricing of such opportunities. BPA has a number of opportunities to market capacity that it has chosen to forgo due to the

need to reserve within-hour balancing capacity. For example, Northwestern Energy has posted several requests for proposals seeking the purchase of within-hour balancing reserves. BPA has been unable to participate in these sales because of the need to provide within-hour balancing reserves as generation inputs.

BPA also has an existing surplus capacity sale to PacifiCorp that expires in 2011 that BPA has been unable to renew, in part due to the need to provide generation inputs. The annual revenue from that 575 MW surplus capacity sale is currently about $60 million.

Additionally, many purchasers have approached BPA seeking the purchase of shaping services to shape the delivery of scheduled amounts of wind generation. BPA is unable to respond to these requests because it has an obligation to provide within-hour balancing reserves to support its BAA.

Finally, MSR is correct that there is not an organized market for capacity reserves in the Northwest, but absent a robust capacity market in the Northwest, BPA is able to monetize the heavy load hour (HLH) energy-generating value of this capacity through forward, day-ahead, and real-time energy markets. Providing within-hour reserves restricts this marketing.

Q. MSR also states that BPA should not socialize the cost of bringing new wind projects onto the system, but should instead charge the new projects the incremental cost of integrating. Arthur, WP-10-E-MS-04, at 10-11. Do you agree?

A. No. For purposes of providing and pricing wind balancing services in this rate period, we have elected to provide both wind and load the benefits of aggregation and diversity from an operational and pricing perspective. We have also used the same costing methodology for allocating costs to all generation inputs providing services for wind and load.

Section 3: Policy Justification for Rates and Charges

Q. According to NWG, BPA's proposed rate for Wind Balancing Service is not cost-based, because it overstates the amount of within-hour balancing reserves required for wind generation using Federal transmission and imposes duplicative charges and penalties for what is essentially the same service. Shimshak and Gramlich, WP-10-E-NG-02, at 3, 4-5. Do you agree?

A. No, we do not.

Q. Please explain why you disagree with NWG's assertion regarding the amount of reserves required for wind generation.

A. The Generation Reserve Forecast in the Initial Proposal is robust. It has been critiqued by a broad array of internal and external stakeholders, and NWG has not provided a viable alternative for purposes of establishing rates in this proceeding. For a more specific rebuttal on these issues, *see* McManus *et al.*, WP-10-E-BPA-42.

Q. Please explain why you disagree with NWG's assertion regarding duplicative charges.

A. As will be discussed in more detail in section 4 below, we do not agree with NWG's assertion that variable costs are opportunity costs or that the Initial Proposal cost allocation for generation inputs constitutes "and" pricing, as defined and used by the Federal Energy Regulatory Commission (Commission). In addition, we disagree with NWG's claim that our proposed Wind Integration cost allocation includes energy costs recovered in BPA's Generation Imbalance Service charges, therefore making these duplicative rates. This issue is rebutted in detail in Bermejo and Beale, WP-10-E-BPA-44.

Q. Please explain why BPA disagrees with NWG's assertion regarding duplicative penalties.

A. We could not identify any of NWG's specific claims from NWG's testimony with regard to penalties. *See* Shimshak and Gramlich, WP-10-E-NG-02. However, there are multiple

broad references to NWG's other testimony, and we assume NWG intended to incorporate the argument that the Wind Balancing Service Rate, Generation Imbalance band II, feathering and curtailment protocols, and Intentional Deviation penalties constitute duplicative penalties. *See* Dragoon, WP-10-E-NG-01. We disagree with this conclusion for a number of reasons. First, the Wind Balancing Service Rate is not a penalty; it is a rate that covers the costs of providing wind balancing reserves. Second, the feathering and curtailment protocols contained in DSO 216 are not penalties. They are reliability mechanisms used to limit the risk and total reserve requirement imposed upon the BPA Balancing Authority. Notably, NWG encourages BPA to adopt these protocols as a measure to reduce the cost of balancing services. Dragoon, WP-10-E-NG-01, at 40. Finally, Generation Imbalance band II and Intentional Deviation penalties are not applied concurrently and therefore cannot be duplicative. Moreover, the Intentional Deviation Penalty exists as a safeguard against inappropriate scheduling behavior. Generators that attempt to schedule accurately can wholly avoid this penalty. Iberdrola confirmed that events that Transmission Services proposes to qualify as Intentional Deviation can occur without triggering the feathering and curtailment protocols. *See* Exhibit 1, Response to Data Request No. BPS-IR-1. Our Initial Proposal attempts to rationally allocate the costs that wind places on the system, and to ensure that appropriate safeguards are in place to protect reliability and incentivize good wind forecasting accuracy and responsible scheduling practices.

Q. NWG states that BPA's proposed rate for Wind Balancing Service discriminates against variable resources and, in part, penalizes these resources for their natural variability. Shimshak and Gramlich, WP-10-E-NG-02, at 3-4. According to NWG, by applying these substantially excessive rates and penalties to only wind generators, BPA is, in effect, giving preferential treatment to other classes of generators and, thereby, creating

opportunities for discrimination against wind generators that could have anti-competitive effects. Id. at 3. Do you agree?

A. No. Our proposed rate for Wind Balancing Service and associated rate mechanisms are designed to capture the costs and manage risks that are being imposed on the BPA Balancing Authority by the variable and uncertain nature of wind energy. Currently there are no solar, wave, or other intermittent thermal or hydro resources of sufficient magnitude to meaningfully increase the balancing requirements of the BPA Balancing Authority. The Initial Proposal allocates the embedded and variable costs associated with holding reserves for wind and other generation inputs, including load following used by BPA's load customers.

Q. NWG states that if BPA wants to propose disparate charges on wind plants, then it must demonstrate that they are just and reasonable, but BPA does not provide adequate cost justification for these substantially excessive charges on wind generators, which would result in an over-recovery of its costs related to wind balancing. Id. at 3-4. Do you agree?

A. No. We have presented significant testimony and studies on the derivation and cost justification of the WI-10 rate. *See* Study, WP-10-E-BPA-08; McManus *et al.*, WP-10-E-BPA-23; Klippstein *et al.*, WP-10-E-BPA-24; and Bermejo and Beale, WP-10-E-BPA-25.

Q. NWG states that BPA proposes to put excessive Wind Balancing Service rates and penalties in place without first implementing the cost-saving operational advances, such as intra-hour scheduling, that allow for the efficient integration of variable resources. Shimshak and Gramlich, WP-10-E-NG-02, at 3. Please respond.

A. BPA has a host of initiatives underway to aid in the integration of variable resources. BPA is pursuing a pilot for third-party provision of balancing reserves, assessing

dynamic scheduling capability into and out of the BPA BAA, and exploring intra-hour scheduling. These initiatives are major technical efforts that involve multiple parties and impact the reliability of the electric system and therefore cannot be adopted without appropriate analysis and review. If BPA were to forgo charging the costs associated with the expected operation of the system until those initiatives were completed, other ratepayers would have to bear those costs in the interim. Further, we do not expect that the existing list of operational advances will be the end of BPA's efforts to enhance the efficiency of wind integration. If BPA were to adopt NWG's suggestion, it is unclear when there would ever be a point to assign embedded and variable costs resulting from cost causation.

Q. Iberdrola states that under the new WIT reliability and operational requirements, wind generators are exposed to curtailment orders and the associated financial impacts for all deviations. Froese et al., WP-10-E-IR-01, at 14. Iberdrola notes that wind generators are also exposed to Intentional Deviation penalties for intentional scheduling deviations. Id. Thus, Iberdrola claims, because wind generators are already subject to two penalty mechanisms to provide an incentive for scheduling accuracy, they do not require and should not be exposed to a third penalty charge of Generation Imbalance. Id. Do you agree?

A. No. Iberdrola is incorrect in stating that "all" deviations will be exposed to curtailment orders. The curtailment and feathering orders to correct deviations will occur only when 90 percent of the system's reserves have been deployed. Iberdrola also agreed in its Response to Data Request No. BPS-IR-1 that Intentional Deviations can occur without triggering feathering or curtailment orders. *See* Exhibit 1. We have already clarified that Intentional Deviation and Generation Imbalance charges will not be applied simultaneously. Generation Imbalance is an important and necessary incentive for

ensuring accurate scheduling, and the implementation of DSO 216 and the Intentional Deviation Penalty under the TR-10 Initial Proposal is designed to apply to only extreme situations. Therefore, there is no justification for exempting wind generators from Generation Imbalance band 2. *See also* Bermejo *et al.,* TR-10-E-BPA-10, for further rebuttal of Iberdrola's contention.

Q. NWG argues that wind generators should be exempt from Generation Imbalance Service Deviation band 2 penalties, because such generators are paying a capacity charge associated with Wind Balancing Service and are paying energy-related "deployment" costs associated with the same within-hour reserves under the Wind Balancing Service. Dragoon, WP-10-E-NG-01, at 39-40. Do you agree?

A. No. This argument represents a persistent misconception of the role of Generation Imbalance that occurs in multiple places throughout various parties' testimony. The Generation Imbalance rate was originally developed for two reasons: to incentivize accurate scheduling and to create a settlement mechanism for the energy that Transmission Providers buy and sell from generators when they under- or over-schedule their generation. The penalty component of the rate, *i.e.*, the percentage of market rates for energy bought or sold, was thought to provide an incentive for good scheduling. Originally, there were two penalty bands (bands 2 and 3) that applied to all generators. In 2001, recognizing the unique characteristics of wind generation, BPA exempted wind from band 3 of the Generation Imbalance Rate. This change was subsequently adopted by FERC in Order 890. In late 2008, when BPA's Wind Integration Team began evaluating the behavior of wind energy on the BPA system and preparing to revise the Generation Reserve Forecast for the FY 2010 rate case, BPA staff determined that the wind fleet was prone to very large scheduling errors. With a much larger amount of wind energy now on the system, it appeared to BPA staff as though there may have been

unintended consequences of the 2001 decision. At the time of that decision, there was less than 200 MW of wind on the system, which is about 20 percent of the wind now on the system. Clearly, the Generation Imbalance Rate, in its current form, did not provide sufficient cost exposure to incentivize good forecasting and scheduling behavior by the majority of the wind fleet.

Arguably, it was not until BPA demonstrated the significant cost implications of poor wind forecasting and scheduling and decided to implement DSO 216 that sufficient incentives were put in place to encourage the wind community to commit to better forecasting. As confirmed by NWG, Dragoon, WP-10-E-NG-01, at 13-14, when notified of these large scheduling errors and their potential cost and operational implications, most of the wind developers were surprised by their limited scheduling accuracy and committed to improving their wind forecasting and scheduling accuracy, and there has been some demonstrable improvement in this direction. Even with these improvements, Generation Imbalance band 2 is still needed to provide an incentive for the wind generators to make small adjustments on an hour-to-hour basis and schedule as accurately as possible.

Generation Imbalance is not a duplicative rate. And the Intentional Deviation Penalty, when it is invoked (which is not at the same time as Generation Imbalance), is another important mechanism to prevent economic gaming of the Generation Imbalance mechanism. We have learned that incentives for good behavior and penalties for bad behavior are an important component of rate design and reliable, cost-effective service.

In addition, NWG confuses the capacity charge associated with the Wind Balancing Service with a capacity option on the Federal System. The Wind Balancing Service rate is not designed to provide such a service. The Wind Balancing Service calculates the cost of holding reserves for each hour assuming customers are making a

good faith effort to schedule accurately and that scheduling errors are reasonably small, randomly distributed, and unbiased (not significantly tending toward over- or under-generation or showing specific patterns by time period). BPA has forecast no costs or revenues for Generation Imbalance Service based on this expectation of accurate scheduling. We disagree with NWG's assertion that deployment costs are part of the Generation Imbalance Charge. For further rebuttal on this issue, *see* Bermejo and Beale, WP-10-E-BPA-44.

Q. Iberdrola provided an example of a wind ramp event and discussed the charges that would apply under that scenario. Froese et al., WP-10-E-IR-01, at 9-11. Do you agree with this assessment?

A. No. Iberdrola's example has methodological and factual errors. Iberdrola assumes that the amount of reserves will be limited to the reserves allocated to wind. This is incorrect. BPA is proposing to use total balancing reserves, for both wind and load, prior to implementing the DSO 216 protocols. Iberdrola also incorrectly assumes that Generation Imbalance and Intentional Deviation would be applied concurrently, when this is not the case.

Q. Is there anything else worth noting about the example provided by Iberdrola?

A. The claims based on Iberdrola's example represent a troubling misunderstanding of the responsibilities incumbent upon a generator. Iberdrola claims that a reduction in *unscheduled* generation to maintain system *reliability* constitutes "lost revenue," as if a generator has a right to operate in any manner it chooses and without regard to the reliability of the electric grid. Also, the example in Iberdrola's testimony shows very poor scheduling accuracy that is inconsistent with Iberdrola's claims on scheduling accuracy. Froese *et al.*, WP-10-E-IR-01, at 26-34. If the scheduler in the example forecast output and actively monitored performance in real time rather than simply

lagging actual generation, it would have adjusted the schedule going into the second and third hours to keep up with the ramp, and most of the costs described in Iberdrola's example would have been avoided and, most likely, the feathering order under DSO 216 would not be required.

Q. What implications would the Iberdrola example have on BPA's system operations?

A. In this example, the wind generator stores a volume of energy into the BPA system over three hours that is roughly double the size of the forecast hourly balancing reserves associated with wind. Because BPA maintains load and resource balance at all times and must perpetually maintain the ability to provide reserves, each of these uses of reserves would require action on the part of hydro schedulers, because BPA does not have unlimited storage and draft capabilities. In addition, the limited flexibility of the system can be consumed by other risks, such as inflow uncertainty and non-power restrictions, and cannot be maintained solely for the benefit of scheduling error on the part of others.

In hour one, the AGC system would automatically use a portion of the reserves under the Wind Balancing Service and the associated storage set aside for that within-hour capability. Entering hour two, the hydro scheduler must re-establish balancing reserve capability by evaluating project constraints and moving generation as needed to free up projects on AGC. There is no opportunity to market the over-generation from hour one in hour two, because the market for that hour closed midway through hour one. At this point, the hydro scheduler must also evaluate the constraints on the system and determine whether to instruct BPA marketing to preemptively sell energy for hour three, because there is a risk that the use of storage in hour one plus the unknown storage in hour two could preclude the ability to provide reserves in hour three. This marketing would occur at the very end of the real-time marketing window for hour three when there are often few counterparties and limited market depth.

If the market depth is insufficient, the hydro scheduler would be required to notify the dispatcher that hour three reserves will have to be reduced due to insufficient reserves capability. This insufficiency would be a direct result of the persistent deviation over the course of several hours and will impact other users of the wind integration service that did not have persistent deviations. Wind generation operators that are diligent about adjusting their schedules and do not attempt to systematically or economically store or withdraw imbalance energy from the Federal system will not be penalized under the Intentional Deviation Penalty.

The costs of multi-hour storage or draft and the costs of pre-emptive marketing are not captured in the Wind Balancing Service rate, because BPA assumes customers are making a good faith effort to schedule accurately and that scheduling errors are randomly distributed and unbiased (not significantly tending toward over- or under-generation or showing specific patterns by time period). Extreme events like the one described in Iberdrola's testimony demonstrate why we continue to support the Initial Proposal and provide justification for DSO 216, Generation Imbalance band 2, and an Intentional Deviation Penalty. All of these tools are needed to incent good scheduling practices, maintain system reliability, and recover costs caused by the variable nature of wind generators.

Section 4: BPA Pricing Proposal for Wind Balancing Generation Inputs

Q. MSR claims that there is only an energy market. Arthur, WP-10-E-MS-04(E1), at 5-6. MSR states that the current Generation Imbalance Charge addresses the economic impact of wind on BPA's participation in this regional market and provides BPA with a mechanism to recover any economic impacts that wind might have on their net energy revenues. Id. Please respond.

A. MSR essentially claims that ratemaking must be based on local market structures and not cost causation. Our proposed rate for Wind Balancing Service would charge users of generation inputs produced by the FCRPS for the costs associated with their use. Pricing such use reflects the reliability impact of such use that can lead to the need to develop additional resources.

The Generation Imbalance charge does not recover any embedded costs of the system. Additionally, the Generation Imbalance charge compensates BPA for only the energy associated with imbalance. The Generation Imbalance charge does not compensate BPA for the impacts associated with making reserve capability available. These costs are the Stand Ready Costs consisting of Energy Shift, Efficiency Loss, and Base Cycle Loss. Also, the Generation Imbalance Charge does not compensate for the impacts associated with actually delivering reserves. These costs are the Deployment Costs consisting of Response Loss, Incremental Cycling Loss, Incremental Spill, and Incremental Efficiency Loss. *See* Study, WP-10-E-BPA-08, sections 4.3 and 4.4.

Q. Iberdrola and NWG claim that BPA is proposing a 400 percent increase to its Wind Integration – Within-Hour Balancing Service rate. Froese et al., WP-10-E-IR-01, at 5, and Shimshak and Gramlich, WP-10-E-NG-02, at 4. Do you agree, and if so, what is the rationale for the proposed increase?

A. We agree in part. The Initial Proposal Wind Balancing Service rate is roughly 400 percent higher than the Wind Balancing Service rate agreed to in the WI-09 rate

settlement. However, the majority of increased costs in our proposed rate are the costs of carrying within-hour balancing reserves to compensate for the inability or failure of wind resources to schedule accurately. *See* McManus *et al.,* WP-10-E-BPA-23, at 15. These costs were excluded from the rate for Wind Balancing Service that BPA established in the WI-09 settlement. In addition, the costs in the Initial Proposal reflect the rapid growth of wind development in the BPA BAA. *See* Mainzer, *et al.*, WP-10-E-BPA-22, at 14. Costs increase significantly when the variation of actual generation to scheduled generation is taken into account.

The embedded unit costs allocated to generation inputs in the Initial Proposal have increased 22 percent from the embedded unit cost allocated for generation inputs in the WP-07 rate proceeding. These cost increases reflect a higher revenue requirement and the fact that, in the FY 2010-2011 rate period, more of the system is being utilized to provide generation inputs.

Q. Why do costs increase when the variation of actual generation to scheduled generation is taken into account?

A. BPA must set aside within-hour balancing reserves to maintain load-resource balance within the BPA Balancing Authority Area. McManus *et al.*, WP-10-E-23, at 2. Increased variation of actual generation to scheduled generation requires additional within-hour reserves to be set aside. McManus *et al.*, WP-10-E-23, at 3. BPA has determined that improvements in the scheduling accuracy of the wind fleet as a whole would reduce the need for the Balancing Authority to maintain as much within-hour balancing reserves and would reduce the rate for Wind Balancing Service.

Q. NWG states BPA's costs have not increased by 400 percent, but that this rate increase is due to new methodologies that BPA has adopted that seek to impose additional – and in

some cases duplicative – charges and penalties on wind generation. Shimshak and Gramlich, WP-10-E-NG-02, at 4. Please respond.

A. We agree that the BPA costs reflected in the Initial Proposal have not increased by 400 percent from BPA's costs at the time of the WI-09 rate proceeding. The 400 percent increase arises from the fact that the rate for Wind Balancing Service established by settlement in FY 2009 specifically did not include all the integration costs imposed by wind generators in the BPA BAA. As discussed above, we do not agree with NWG that the charges and, in one case, penalty proposed in the Initial Proposal are duplicative.

The only charge that NWG specifically identifies as duplicative is the deployment costs included in BPA's estimate of variable costs for providing within-hour balancing reserves. NWG mistakenly considers these costs to be the same costs as the energy supplied under the Generation Imbalance charge. These deployment costs are losses the system incurs to actually provide reserves, not the energy actually provided to meet the imbalance. The Generation Imbalance rate compensates BPA for the short-term value of the megawatthours actually provided to the load the generator is serving and cannot recover megawatthours that are lost (that is, not provided to any load) as a result of the deployment of reserves. *See* Bermejo and Beale, WP-10-E-BPA-44, for further rebuttal on this issue.

Q. NWG states that BPA's methodology for calculating the proposed rate for Wind Balancing Service includes embedded, incremental, and opportunity costs. Shimshak and Gramlich, WP-10-E-NG-02, at 5; and Dragoon, WP-10-E-NG-01, at 3. Do you agree?

A. No. We agree with NWG that in the Initial Proposal, we allocate embedded costs to wind generators for the generation inputs. We also allocate variable costs that reflect additional costs that BPA incurs in providing reserves. NWG states that it considers the

costs BPA has identified as variable costs to be the opportunity costs of providing reserves on BPA's system, but we disagree with this assertion.

Q. *NWG states that the inclusion of both the embedded and variable costs in the Initial Proposal is inconsistent with FERC's "and" pricing policies, which allow a transmission provider to collect the higher of either embedded costs or opportunity costs, but not both categories of costs. Shimshak and Gramlich, WP-10-E-NG-02, at 5; and Dragoon, WP-10-E-NG-01, at 4. Do you agree?*

A. No. The variable costs identified in the Initial Proposal are not the same as opportunity costs and are analogous to fuel costs of thermal resources. In a thermal system, the fuel costs consumed to spin the generator (such spinning does not produce any energy) would be added to the embedded cost, and these fuel costs would be considered variable, based on the amount of fuel consumed to provide the needed reserves and the efficiency curve of the generator at the time the fuel is consumed. In a hydro system, the fuel is water. Some fuel (water) is consumed by being spilled or a change in the efficiency curve of the generator, and other amounts of fuel (water) are consumed by being shifted in the time it is available for energy production. The cost associated with generator efficiency is the cost of water lost to set up the hydro system to provide reserves. The cost of time shifting water from HLH to light load hours (LLH) is a loss of value not included in our embedded cost calculation. Whereas a thermal plant can measure cost of fuel consumed to provide reserves by the amount of fuel purchased and burned, we have measured the variable hydro fuel cost by comparing the value of the water with and without providing the reserves.

Q. NWG states that the costs that BPA describes as "variable" costs are primarily the opportunity costs associated with BPA setting aside generating capacity to provide within-hour reserves. Dragoon, WP-10-E-NG-01, at 24. Do you agree?

A. No. Opportunity costs would be the value BPA received for its highest and best value alternative use of the system. If BPA were not required to provide within-hour balancing reserves, BPA could sell the capacity used for such service to other Balancing Authorities that need within-hour reserves or other capacity products. If, for example, the market value of capacity is $7.00/kW/mo., then 1,045 MW of reserves could realize about $88 million per year. We have valued the "variable cost" based on the residual value of forecast spot market energy lost when the water (fuel) is consumed, not the opportunity cost it could receive for the capacity. In the Initial Proposal, the variable cost allocated to wind is $43 million per year, half of the opportunity cost valued at $7.00/kW. At 30-minute persistence forecast accuracy, the amount of variable cost allocated to wind drops to $21 million, again half of the opportunity cost of $45 million valued at $7.00/kW. The shift in the timing and quantity of BPA's secondary energy sales results in a degradation in value, but is not an "opportunity cost" from an economic perspective. BPA still has the opportunity to market secondary energy; it just must do so at different times of the day from the economic optimum, and with a diminished total quantity of available megawatthours due to the turbine efficiency losses associated with holding and deploying reserves.

Q. NWG asserts that, in committing to provide within-hour reserves, it is a fundamental assumption that BPA will not be able to use turbines that are providing reserves to generate power for sale. Dragoon, WP-10-E-NG-01, at 24. NWG states that because BPA has already allocated a share of the revenue requirement for the Big 10 hydro

facilities to the wind generators, charging for lost profits and forgone sales is, in effect, selling the same megawatts twice. Id. Do you agree?

A. No. As described above, the variable cost is analogous to a thermal generators' fuel cost and simply measures the lost efficiency and shift from HLH to LLH caused by carrying reserves. This is not selling the same megawatts twice.

Q. NWG claims that BPA's Variable Cost Pricing Methodology represents BPA's estimate of all of the operational costs incurred to provide Wind Balancing Service. Dragoon, WP-10-E-NG-01, at 26. Thus, NWG states, this amount should be more than adequate to hold BPA's native load customers harmless. Id. NWG also recommends that a portion of the costs in BPA's Variable Cost Pricing Methodology, the "deployment costs," are essentially an energy charge, and to the extent used to provide imbalance energy service, are duplicative of the Generation Imbalance Service charge. Id. at 27. If BPA were to adopt NWG's proposed approach to pricing wind balancing reserves, how much would BPA recover in annual revenues?

A. NWG recommends that BPA adopt a 30-minute persistence forecast accuracy to measure the required reserves. Dragoon, WP-10-E-NG-01, at 23. A 30-minute persistence forecast accuracy and NWG's other recommendations would result in generation input costs for the Wind Balancing Rate of approximately $10 million annually, which does not account for all the other methodological changes proposed by Iberdrola and NWG in calculating the required amount of within-hour reserves. This suggested amount is roughly half the $19 million amount of the settlement of the WI-09 rate without taking into account the increase in the forecast amount of wind and the increased reserves needed due to the inability or failure of the wind fleet to schedule accurately. NWG's recommendation is not consistent with its own argument, because "and" pricing allows

the provider to recover the higher of embedded or opportunity cost, and NWG is advocating for something much less than the lower of embedded and opportunity cost.

Q. *NWG goes on to state that BPA should adopt a reasonable cost-based rate for integrating wind resources that is set no higher than the level that holds BPA's native load customers and transmission customers harmless for the additional use of the FCRPS by the wind fleet. Dragoon, WP-10-E-NG-01, at 29. Accordingly, NWG states, the Wind Balancing Service Rate should be based on either: i) the share of the embedded costs of the Big 10 hydro projections associated with providing Wind Balancing Service; or ii) the opportunity costs associated with the Variable Cost Pricing Methodology. Id. Do you agree?*

A. No. While it is our understanding that the Commission's "and" pricing policy does not apply to BPA pricing methodologies, we do not believe the proposed pricing methodology constitutes "and" pricing. Generally, as a matter of policy, BPA voluntarily complies with FERC's policies. The embedded cost methodology in the Initial Proposal used only the forecast of *inc* reserve needed to support wind integration, and if the generation inputs cost allocation included only the embedded cost method, there would be no cost recovery associated with providing *dec* reserves. We could increase the amount of reserves allocated to the embedded costs to the combined total of *inc* and *dec* reserves. This would result in an embedded cost allocation based on 2,534 MW of wind-balancing reserves, as compared to the 1,045 MW of *inc* reserves that was used in the Initial Proposal. In the alternative, BPA could voluntarily comply with NWG's interpretation of FERC's "and" pricing policy by either modifying the variable cost to remove energy shift cost associated with *inc* reserves or charging embedded costs for "*inc*" reserves and variable costs for "*dec*" reserves.

Q. Would it be reasonable to allocate embedded costs to the sum of "inc" and "dec" reserves?

A. It could be, but charging embedded cost based on both the *inc* and *dec* reserve forecast would significantly increase the Wind Balancing Service rate from its level in the Initial Proposal. We believe that the Initial Proposal strikes a good balance by allocating only the embedded cost based on the *inc* reserve amount and adding the variable cost component to account for the fuel costs associated with both *inc* and *dec* reserves. Arguably, *dec* reserves put more strain on the system and are harder to produce or procure than *inc* reserves. An alternative that could be considered is allocating embedded costs on the higher of the amount of *inc* or *dec* within-hour balancing reserves. Under the 2-hour persistence forecast accuracy used to estimate reserves in the Initial Proposal, the amount of within-hour reserves used to allocate embedded costs would increase from 1,045 MW to 1,489 MW.

Q. How would you construct a charge with embedded costs for inc reserves and variable costs for dec reserves?

A. We could modify the methodology to charge only variable costs for the *dec* reserves portion of variable costs. In the Initial Proposal, variable costs for *dec* reserves were $37.3 million, as compared to $58.2 million for both *inc* and *dec* on all generation input reserves. *See* Study, WP-10-E-BPA-08, Table 4.15.

Q. Do you believe eliminating the inc reserve component from the variable cost calculation is a reasonable response to NWG's "and" pricing argument?

A. No. Even if we accept NWG's premise, then arguably only a small portion of the variable costs could fit that description. Almost all of the variable costs do not meet NWG's premise.

The variable costs are divided into two categories of costs, Stand Ready Costs, documented in the Study, WP-10-E-BPA-08, section 4.3, and Deployment Costs, documented in the Study, WP-10-E-BPA-08, section 4.4. The Deployment Costs are efficiency losses that occur when BPA provides reserves and represent actual losses of water associated with deploying reserves. The Stand Ready Costs are divided into three components: Energy Shift, Efficiency Loss, and Base Cycle Loss. Both the Efficiency Loss and the Base Cycle Loss are efficiency losses measured by the water that is actually lost when the system is set up to stand ready to supply the reserves. The only category of variable costs that could possibly fit NWG's premise of selling the same MW of generating capacity twice is the *inc* portion of the Energy Shift component of the Stand Ready Costs.

Q. *NWG states that, by requiring wind generators (but not non-wind generators or BPA's native load customers) to pay a capacity charge for imbalance service under the Wind Balancing Service Rate, BPA has refused to provide imbalance services to wind generators on a comparable basis with other consumers of imbalance service. Dragoon, WP-10-E-NG-01, at 4. Please respond.*

A. We have not separately identified a capacity charge for generation imbalance for generators other than wind, because we have not identified significant amounts of within-hour reserves that must be set aside to meet such uses of the system. As noted above, there are substantial amounts of reserves required to follow load, but the costs of carrying these reserves are recovered through other existing power BPA rates paid by power customers.

Q. *Based on the pricing issues raised by MSR, Iberdrola, and NWG, should BPA consider any modifications to the proposed generation inputs pricing methodology for wind balancing reserves?*

A. The Initial Proposal was based on the principle of cost causation and sought to recover costs for within-hour balancing reserves by adopting a common costing methodology for allocating costs of generation inputs for all uses. We applied that principle for allocating the embedded costs of the system and the variable costs of providing within-hour balancing reserves to uses of generation inputs by both loads and generation. Our proposal provides a reasonable cost-based rate for generation inputs, set at the level that allocated to BPA's power customers and transmission customers the costs for the relative usage of the FCRPS by load and wind generation. The proposals made by the wind generators are generally unsupportable, and when these proposals are evaluated in detail, appear to have little or no merit. However, the options for modifying the variable cost methodology described above could be considered for the Final Proposal.

Section 5: Sufficiency of Reserves

Q. Several parties reference BPA's Preliminary Needs Assessment and contend that this document shows that BPA does not have enough capacity to provide the amount of reserves forecast in the Initial Proposal. For example, JP6 states that Approach C in the Preliminary Needs Assessment concludes that BPA does not have sufficient balancing reserves to integrate the amount of wind generation that the Study, WP-10-E-BPA-08, forecasts will be interconnected in the BAA in FY 2011. Baker et al., WP-10-E-JP6-01, at 7. NWG claims that BPA's cost calculations assume that BPA will, in fact, be able to provide such services from FCRPS resources, but the Preliminary Needs Assessment suggests that BPA may not be able to fully provide all of these reserves. Dragoon, WP-10-E-NG-01, at 30. Please respond.

A. The Preliminary Needs Assessment, as its title indicates, is preliminary and is currently being reviewed in the region. BPA's Preliminary Needs Assessment breaks new ground

by assessing the capacity and flexibility needs of the Federal system in new ways. If no changes occur in scheduling accuracy or operational protocols, parties' concerns about the ability of BPA to meet reserve needs may be appropriate. BPA is concerned about ensuring that the Federal system has the capability to meet the many obligations and operating constraints it faces and thus included balancing reserve as one of the elements in the analysis. In the conclusion of the Wind Reserve Impact Study section, the authors state that the results "indicate a system condition where meeting the reserve requirements and satisfying other power and non-power requirements would be extremely difficult." Baker *et al.*, WP-10-E-JP6-02, Attachment 1, at 44. This analysis was based on the WIT study of reserve needs during the FY 2010-2011 rate period.

Q. How would the lower persistence scheduling accuracy used to determine the amount of reserves needed affect this issue?

A. Both the Initial Proposal and the WIT study used in the Preliminary Needs Assessment relied on a 2-hour persistence scheduling accuracy. As reserve levels decrease with shorter persistence scheduling accuracies, the risk of conflicts with other operating requirements decrease.

Q. How would a lesser amount of wind generation connected to BPA's system during the rate period affect this issue?

A. Both the Initial Proposal and the WIT study used in the Preliminary Needs Assessment used then-current estimates of wind generator interconnections. If those estimates are reduced, the reserve requirement in the rate period will decrease, as will the risk of conflicts with operating requirements.

Q. How does BPA's planned DSO 216 mitigate these concerns?

A. There are two aspects of DSO 216 that address this issue. The ability to implement the feathering and curtailment instructions contemplated under DSO 216 offer BPA

assurance that it can limit within-hour reserves exposure to a specified quantity, which protects the Balancing Authority from a number of the reliability risks associated with provision of balancing reserves. The Preliminary Needs Assessment did not take into account these risk protections and limitations on the amount of reserves BPA would have to provide. DSO 216 also contemplates that there may be unforeseen conditions, or cases of extreme use, where provision of reserves must be constrained to a lower amount to protect the operation of the hydro system. This aspect of the DSO would allow BPA to provide a much larger amount of reserves over the large majority of conditions than could be provided under an alternative where BPA was required to provide reserves regardless of patterns of usage.

Q. Does BPA have enough reserve capacity to meet the forecast reliability needs in the FY 2010-2011 rate period?

A. Between available system and the operational protocols of DSO 216, we believe BPA would be able to maintain system reliability. Ultimately, though, the answer to this question will depend on a number of issues that are in play in this rate proceeding. These issues include the forecast quantity of interconnected wind and the amount of reserves required to support that wind, which will depend on the persistence forecast accuracy of wind scheduling and the functionality of DSO 216. Other factors that must be considered include the capabilities of the hydro system during the rate period, which depends on water conditions and other non-power requirements.

Section 6: Rate Implication of the DSO and the Persistence Forecast Accuracy Determination

Q. JP6 notes that BPA has not developed or drafted the proposed DSO 216 that would provide for the curtailments that BPA has stated are necessary to make its use of better-

than-demonstrated scheduling accuracy work; thus, no one can say with any certainty whether the DSO 216 that is adopted and implemented will contain the elements needed to enforce curtailments or provide for curtailments need to protect the interests of power customers. Baker et al., WP-10-JP6-1, at 16. Please respond.

A. While we are confident that BPA will be able to implement the operating and reliability requirements developed by the WIT, we acknowledge that it is impossible to determine BPA's success with developing and implementing such protocols in the future. There are two elements of the DSO 216 being developed by the WIT that are necessary to make better-than-demonstrated accuracy work: generation reductions at the wind projects for over-generation and schedule reductions for under-generation. The first element is already a proven concept. BPA currently employs a manual process in operations for generation reductions. Through the WIT, BPA is working to greatly enhance internal infrastructure and processes around the current practice. The WIT has engaged in an extensive and ongoing public process to address the stakeholder concerns in the development of the DSO. With respect to the second element of the DSO, we expect the WIT to address any stakeholder concerns and suggestions regarding the DSO in the WIT forums. Our understanding is that the WIT is making progress on drafting the DSO and that BPA's customers and stakeholders have actively participated in that public process.

Q. According to Iberdrola, although BPA states it would be "unfeasible" for BPA to implement 30-minute persistence forecast accuracy unless all wind generators execute agreements with operating and reliability requirements, and that execution of such agreements is a necessary "precondition" to adoption of such an accuracy standard, BPA has admitted that it believes it already has the necessary authority to require wind generation to comply with BPA operational and reliability requirements. Froese et al.,

WP-10-E-IR-01, at 34. Thus, Iberdrola asserts, BPA can maintain system reliability at a 30-minute persistence forecast accuracy. Id. Do you agree?

A. No. With respect to adopting a 30-minute persistence forecast accuracy, the issue is not BPA's authority to implement its operational and reliability requirements. We are concerned about the reliability impacts that result if all wind generators in the BAA fail to meet a 30-minute persistence forecast accuracy assumption during the rate period. If some wind generators are not meeting 30-minute persistence forecast accuracy, the wind fleet as a whole will consume balancing reserves faster, thus triggering the DSO to preserve reliability of the BPA system more frequently. Iberdrola's assertion, like that of NWG, that the DSO alone allows BPA to maintain system reliability is also a problem.

Q. NWG asserts that holding an amount of reserves associated with a higher degree of scheduling accuracy than is currently observed will not expose BPA or its customers to additional risks. Dragoon, WP-10-E-NG-01, at 22. According to NWG, BPA's proposed WIT protocols effectively maintain system reliability by causing the wind generators to self-supply any reserves needed above the total amount reserved for wind. Id. Please respond.

A. As discussed above, even with DSO 216, the balancing reserve level for wind needs to be reasonably related to the scheduling performance of wind. If BPA holds lower levels of reserves than necessary to provide balancing services during the rate period, it is likely that the incidences of generation reductions and curtailments will increase. Curtailments are particularly concerning because other Balancing Authorities will have to deploy replacement resources to maintain reliability. Similarly, the potential for reliability impacts to the BPA system will also increase. In addition, BPA would not use NWG's terms to describe the WIT protocols. The WIT protocols do not cause wind generators to "self-supply" for under-generation conditions. The obligation for reserves beyond the

amount held by BPA would fall on the Balancing Authority where the load resides, which may be another Balancing Authority or may be the BPA Balancing Authority. We agree that wind generators lessen the need for additional reserves to absorb over-generation by providing the means to avoid that over-generation. While at times this is described as self-provision, self-provision more accurately describes conditions where, in lieu of paying the rate for that service, a customer makes a service available to the Balancing Authority, or transmission provider, that can be deployed for general use *(e.g.*, self-provision of contingency reserves).

Q. JP6 states that it is not confident that BPA has demonstrated that, if the WIT reliability and operational requirements are fully and successfully implemented, such measures would prevent or significantly curb over-use of balancing reserves by the wind fleet. Baker et al., WP-10-E-JP6-01, at 12-14. Please respond.

A. There are two elements of JP6's concerns regarding "over-use": 1) wind usage of reserves set aside for load following and 2) wind over-use of reserves in excess of the total forecast requirement. The rate design addresses the former, and the proposed implementation of DSO 216 addresses the latter.

In actual operations, it is correct that BPA will use the total reserves to meet the needs of either load or wind. However, the proposed incremental standard deviation (ISD) allocation methodology of balancing reserves addresses the degree to which load or wind are contributing to that total. McManus *et al.*, WP-10-E-BPA-23, at 21-23; and McManus *et al.*, WP-10-E-BPA-42, section 5. Thus, we believe that instances of wind using a larger proportion of the total reserves have been captured in our reserve quantification proposal.

We also believe that a full and successful implementation of the reliability and operational requirements under DSO 216 will eliminate use of reserves in excess of the

total reserves available. We recognize that the lack of implementation details on DSO 216 makes it difficult for parties to accept this at this time.

Q. *JP6 states that reliance on the proposed DSO alone is not a guaranteed means of improving forecasting or curbing use of balancing reserves in excess of the rate case forecast of the system reserve requirement or the reserve requirement for wind generation. Baker et al., WP-10-E-JP6-01, at 14. According to JP6, wind plant owners and operators would have a strong incentive to seek to have BPA to set aside additional reserves to mitigate curtailments. Id. at 15. Do you agree?*

A. As stated above, we believe that implementation of the proposed DSO will curb the use of balancing reserves in excess of the forecast. We agree that the DSO alone is not a guaranteed means of improving wind forecasting and scheduling. We believe that the combination of the successful implementation of the DSO, Generation Imbalance, and effective measures to discourage persistent deviations, offers an appropriate set of incentives to improve forecasting. Whether the wind generators have the capabilities to respond to these incentives is one of the key issues being addressed in this proceeding in choosing an appropriate persistence forecast accuracy to determine the level of reserves.

Q. *JP6 states that BPA is not prevented from setting aside and deploying additional balancing reserves to balance wind generation during the rate period. Baker et al., WP-10-E-JP6-01, at 15. Do you agree?*

A. While BPA would not be prevented from setting aside and deploying additional reserves, we believe BPA will not be not motivated to do so, because higher levels of reserves increase the risk to non-power operations, and there are financial costs associated with carrying and providing additional reserves.

Q. *Based on the issues raised regarding the DSO and the testimony of the parties on the appropriate persistence forecast accuracy BPA should use for forecasting the reserve*

needs of the wind fleet, has your policy recommendation on the persistent scheduling level changed since the Initial Proposal?

A. Yes. As discuss in McManus *et al.*, WP-10-E-BPA-42, section 4, we have noticed an improvement in overall forecast accuracy. This improvement in scheduling accuracy appears to be attributable to the awareness campaign that the BPA Wind Integration Team initiated after illustrating the scheduling quality BPA was receiving. The improvement in scheduling accuracy appears to have begun in September 2008 and has been sustained. BPA used multiple measures to evaluate accuracy and determined that scheduling patterns are currently best represented by the 60-minute level of reserves. Based on this new information and issues raised by the parties, the range of decisions that should be considered for the final proposal should probably not include 2-hour persistence forecast accuracy; but 60-minute, 45-minute, and 30-minute are still options. However, we acknowledge that there are continuing uncertainties with regard to scheduling improvements and the DSO that may not allow for moving to the lowest persistence forecast accuracy at this time.

Q. JP6 states that if BPA adopts a wind balancing rate based on a 30-minute, 45-minute, or 60-minute persistence forecast accuracy assumption rather than 2-hour persistence forecast accuracy, BPA would be speculating that the assumed scheduling accuracy level could or would be met or exceeded consistently throughout the rate period. Baker et al., WP-10-E-JP6-01, at 10-11. As a result, JP6 states, BPA would be moving away from a rate based on demonstrated scheduling accuracy to one that assumes improvements in scheduling behavior that most likely will require investment in information and expertise to make improvements. Id. Do you agree?

A. At the time of the Initial Proposal, we would have agreed that BPA would have had to assume improvements in scheduling accuracy. We now believe that an improvement in

the scheduling accuracy to the 60-minute level has been demonstrated. McManus *et al.*, WP-10-E-BPA-42, section 4.

Q. JP6 states that if BPA assumes in its generation reserve forecast a persistence forecast accuracy level that is better than the observed scheduling accuracy of two hours, the wind fleet would use balancing reserves in excess of those set aside for wind. Baker et al., WP-10-E-JP6-01, at 11-12. JP6 argues that those excess reserves would either be balancing reserves set aside for, and paid for by, load for its regulation and load-following needs or would be reserves in excess of the rate case forecast total system reserves requirements. Id. Please respond.

A. JP6's statement assumes that the methodologies described in the Initial Proposal and the planned DSO are somehow allocating a set amount of reserves to load and to wind. This appears to be a misunderstanding of the distinction between operations and rate design. The Initial Proposal uses both wind and load reserve requirements to establish a total reserve requirement. Then, for purposes of allocating costs to rates, the total reserve amount is assigned to the various reserve uses. In the WIT forum, the WIT is developing the operating and reliability requirements to use the total amount of reserves determined in accordance with rate case decisions to establish the measure of when the DSO is activated (when 90 percent of the total reserves are deployed), but the assignment of the reserve total to specific reserve uses is not intended to be part of the DSO.

Q. NWG states that a 2-hour persistence forecast accuracy assumption is not reasonable. Dragoon, WP-10-E-NG-01, at 13-14. NWG asserts that a 2-hour persistence forecast accuracy assumption does not take into account: i) current scheduling accuracy; ii) the efforts to continually improve scheduling accuracy; iii) the fact that wind schedulers are financially motivated to improve the accuracy of their wind schedules; iv) the fact that BPA does not have enough reserves to provide wind balancing on the 2-hour persistence

accuracy; and v) that the level was not accuracy assessed due to systematic errors in the scaling methodology. Id. at 16. Please respond.

A. As stated above, we now believe that basing rates on a 2-hour persistence forecast accuracy may not be a reasonable assumption. As stated above, the latest data suggests that the wind fleet has adjusted its scheduling behavior and is now more aligned with a 60-minute persistence forecast accuracy, which appears to be based on the efforts of the wind generators to improve scheduling accuracy. However, there is little or no basis to support an assertion that wind scheduling accuracy will continue to improve without additional motivations.

We disagree with the assertion that wind generators currently have true financial motivation to improve scheduling accuracy beyond the already-recognized improvement. However, we do believe that the incentives *(e.g.*, Generation Imbalance Service charges and Intentional Deviation Penalty) and the reliability and operational requirements BPA plans to implement will financially motivate wind schedulers to schedule as accurately as possible and invest in new scheduling technologies.

As to whether or not BPA will have enough reserves to support a 2-hour persistence forecast accuracy, *see* the discussion in section 5 above, and for a full rebuttal of NWG's claim that the scaling methodology contained systematic errors, *see* McManus *et al.*, WP-10-E-BPA-42, section 3.

Q. Iberdrola states that if BPA adopts a wind balancing rate based on 2-hour persistence forecast accuracy for the rate period, but wind generators achieve a 30-minute persistence forecast accuracy, BPA will end up holding out too many reserves over the rate period. Froese et al., WP-10-E-IR-01, at 33-34. Iberdrola argues that paying for more reserves than necessary unduly penalizes existing wind facilities, discourages

future wind development, and improperly subsidizes BPA native load customers. Id. Do you agree?

A. No. If BPA were to hold out a higher reserve level than is necessary, BPA agrees it would result in a cost shift that would be imposed upon wind generators to the benefit of load customers. In ratemaking, it is often the case that over- or under-estimation of key components will result in costs being carried by parties other than those causing the costs. BPA is experiencing that phenomenon under the WI-09 rate. BPA estimated that roughly 200 MW of additional capacity would meet the balancing needs of wind generation, but in actual operations, midway though that period BPA is finding it needs to carry over 500 MW of capacity for that service. Loads are experiencing the resultant financial consequences of that increase in demand.

Q. OPUC states that BPA should offer a rate based on a 30-minute persistence forecast accuracy and a rate based on a 45-minute persistence forecast accuracy and allow companies the opportunity to choose which rate they want. Hellman et al., WP-10-E-PU-01 at 14. Do you agree?

A. No. Such an effort would significantly complicate an already complex rate design and process implementation. In addition, it would require BPA to speculate on the proportion of the wind fleet that would select each level of forecast accuracy, adding significant risk to the ratesetting process. BPA already faces a considerable implementation effort to establish generation reductions and schedule curtailments using a single persistence forecast accuracy. Adopting multiple levels would further complicate that task.

Q. JP6 states that at least one party has objected to BPA's claim of authority to implement and enforce generation and schedule curtailments through the proposed DSO, at least for wind generation with executed LGIAs. Baker et al., WP-10-JP6-01, at 16. According to JP6, if a party successfully challenges BPA's authority to adopt and enforce the proposed

DSO, BPA's ability to use curtailments to enforce more accuracy scheduling would be frustrated. Baker et al., WP-10-JP6-01, at 16. Please respond.

A. We agree that if BPA were unable to enforce the proposed DSO, it would definitely stress its ability to reliably integrate and manage variable wind power in the BPA Balancing Authority. The purpose of the DSO is to establish the necessary reliability protocols and mechanisms to protect and responsibly manage system reliability. The DSO is a critical and necessary component of BPA's ability to reliably integrate large amounts of variable wind generation into the BPA Balancing Authority.

Q. NRU states that BPA should adopt a 45-minute persistence forecast accuracy assumption but place on wind plants the financial risk created by inadequate or imprecise scheduling or failure of operational mechanisms to curb excessive use of BPA balancing reserves compared to what others can achieve. Carr and Stratman, WP-10-E- NR-01 at 7. Do you agree?

A. NRU's support for a 45-minute persistence forecast accuracy, under certain conditions and with appropriate risk mitigation measures, is consistent with JP6's proposal that is discussed in more detail in section 7.

Section 7: Cost Shifts

Q. Snohomish states that the cost to add the necessary energy, capacity and ancillary capabilities required to support nearly 4,300 MW of wind capacity by FY 2011 must be borne by the resource providers, not by BPA's existing preference loads. Miles, WP-10-E-SN-2, at 5-6. Similarly, JP6 states that the costs of wind balancing reserves are part of the cost of delivery of wind energy and so should be borne by the wind plant owners or wind energy purchasers. Baker et al., WP-10-E-JP6-01, at 8. Please respond.

A. There does not seem to be disagreement among the parties that purchasers of wind energy should pay their fair share of the costs of within-hour balancing reserves needed to support the delivery of wind generation. *See* Arthur, WP-10-E-MS-01, at 5; Shimshak and Gramlich, WP-10-E-NG-02, at 5. The disagreement revolves around what amount is a fair share.

Q. In support of its argument for a 30-minute persistence forecast accuracy for reserve requirements, NWG claims that, with the DSO in place, there are no additional costs imposed on BPA customers related to holding a lower reserve level. Dragoon, WP-10-E-NG-01, at 22-23. Please respond.

A. Under the reliability and operational requirements developed by BPA's Wind Integration Team, BPA would be able to instruct wind generators to reduce output when BPA is close to having committed its total amount of *dec* reserves for balancing. In addition, BPA would be able to revise transmission schedules sourced from wind generators when actual wind generation is below schedule and BPA is close to exhausting *inc* reserves. With such operational and reliability requirements in place, BPA would need a smaller amount of balancing reserves, which could lower proposed rates accordingly.

We agree that successful implementation of BPA's reliability and operational requirements, such as DSO 216, and adoption of a 30-minute persistence forecast accuracy may ensure cost recovery of the balancing reserves BPA provides to wind generators. At the same time, BPA must evaluate the technical risks associated with DSO 216 and weigh the risks of adopting a level of scheduling accuracy that is better than the demonstrated capability of the wind fleet.

Q. Snohomish states that if the reserve requirements established for the wind fleet for the rate period are not accurate, then there will be a cost shift between wind resource providers and load customers. Miles, WP-10-E-SN-02, at 2-3. Both Snohomish and JP6

note that if reserve requirements are understated, BPA's costs will be inappropriately allocated to load serving customers through disproportionately high Regulation and Frequency Response and Load Following Reserve rates. Id.; Baker et al., WP-10-E-JP6-01, at 16-17. Please respond.

A. If the reserve requirements are understated, we would allocate fewer embedded costs to generation inputs and more of the embedded costs to BPA's power customers. These costs will be recovered in the energy charges paid by the power customers. In addition, Slice customers will be assigned their share of the actual reserve needs of the system on a monthly basis in exchange for their share of the costs assigned to Transmission Services to cover the forecast amount of reserve requirements used to allocate costs to generation inputs.

Q. JP6 goes on to state that if the wind fleet uses more reserves than set aside for the total system reserve requirement, the additional cost of the balancing reserves would be an unrecovered cost of the FCRPS during the rate period and would likely result in a reduction in Power Services' financial reserves. Baker et al., WP-10-E-JP6-01, at 17. Do you agree?

A. Yes. If the wind fleet uses more reserves than forecast, BPA will face additional variable costs for providing the additional reserves. These variable costs will reduce PS financial reserves.

Q. JP6 states that if the proposed DSO does not prevent the over-use of balancing reserves that load has paid for, then load would be paying for balancing reserves that are being used by wind plants, which would represent an unfair allocation of costs to load from wind generation. Baker et al., WP-10-JP6-01, at 17. Do you agree?

A. Not necessarily. If JP6 is concerned that reserves set aside for both load and wind are used by the Balancing Authority to meet its combined obligations for use of within-hour

balancing reserves, we do not agree that the use of the reserves for any particular reason on an hour represents an unfair cost shift. If JP6 is concerned that DSO 216 is not successfully implemented and the Balancing Authority ends up using more within-hour balancing reserves than forecast, we agree that power customers would pay the increased costs of these reserves, which would represent an unfair allocation of costs to load from wind generation.

Q. JP6 suggests that an acceptable alternative to mitigate the risk that wind balancing costs would be shifted to power customers is for BPA to adopt a 45-minute persistence forecast accuracy assumption; adopt and implement the proposed WIT reliability and operational requirements; and adopt a ratchet charge of $1.00 per kW per month that BPA would apply in addition to the base rate. Baker et al., WP-10-E-JP6-01, at 20-21. Please explain your understanding of this proposal.

A. The JP6 proposal consists of three parts. First, the costs and rate would be based on a 45-minute persistence forecast accuracy assumption. Second, the proposed DSO 216, as outlined under the principles in the BPA paper, would be adopted and implemented. Third, a ratchet charge of $1.00 per kW per month would be added to the base rate under specific circumstances, and the monies collected would be a revenue credit to Power Services. The ratchet would apply to all wind plants in the BPA BAA for the remainder of the rate period in the event that the adopted DSO, any successor DSO, or revisions to existing or future LGIAs in regard to a wind plant's obligation to obey the adopted DSO are set aside or cannot be enforced. Also the ratchet would apply to individual wind plants in FY 2011 that did not meet or exceed the 45-minutes persistence forecast accuracy level in FY 2010 or did not meet that scheduling accuracy level within three months of their full service date in FY 2011.

Q. Does the JP6 proposal have merit?

A. Yes. The concept proposed by the JP6 deserves further consideration. To reduce the level of within-hour balancing reserve below the level that would be necessary based on the demonstrated capability of wind resources to schedule accurately, BPA must have the ability under its operational and reliability requirements to feather and curtail wind schedules when 90 percent of reserves have been deployed. Adopting some form of ratchet charge, perhaps limited to events that are beyond BPA's control, would protect the rates of BPA power customers if BPA was unable to implement its reliability and operational requirements, such as DSO 216.

Q. JP6 suggests that BPA should apply a ratchet charge of $1.00 per kW per month in addition to the base Wind Balancing Service rate for the balance of the rate period, to all interconnected wind plants if, at any time during the rate period, BPA's DSO 216 or any successor DSO is set aside or cannot be enforced. Baker et al., WP-10-E-JP6-01, at 20-21. Do you agree?

A. No. The amount of the ratchet that JP6 has suggested is comparable to the difference between the 2-hour persistence forecast accuracy in the Initial Proposal and the estimated rate resulting from a 45-minute persistence forecast accuracy. Based on the new information regarding the improvement to 60-minute scheduling accuracy, it would appear that JP6's proposed ratchet charge is excessive.

Q. JP6 suggests that for FY 2011, BPA should apply a ratchet charge of $1.00 per kW per month in addition to the base Wind Balancing Service rate to those wind plants that do not on average meet or exceed the 45-minute persistence forecast accuracy level during FY 2010, or to those wind plants that do not meet or exceed the 45-minute persistence forecast accuracy level within three months of their full service date in FY 2011. Baker et al., WP-10-E-JP6-01, at 20-21. Do you agree?

A. Based on our understanding of this portion of JP6's proposal, we do not agree. We understand the JP6 proposal to mean that BPA should apply a ratchet charge to all wind generators that fail to achieve a 45-minute persistence forecast accuracy during certain specified periods. While we agree that applying a ratchet to individual generators that do not achieve a certain level of scheduling accuracy would provide an incentive to schedule more accurately, we do not see a cost basis to assume a ratchet consistent with 2-hour persistence forecast accuracy for any generator that fails to achieve scheduling accuracy equal to a 45-minute persistence forecast accuracy.

Q. Are there other changes to the Initial proposal that you now propose?

A. Yes. As described in the Initial Proposal, McManus *et al.*, WP-10-E-BPA-23, at 24, we are proposing to use a new method for incorporating load forecast assumptions into the reserve forecast methodology. In addition, we have revised our method for calculating the total reserve requirement in the reserve forecasting methodology. McManus *et al.*, WP-10-E-BPA-42, section 6.

Q. Are there policy implications of this proposed change?

A. Yes. We believe these changes in the reserve forecast methodology better reflect actual conditions on the system and the information needed in actual operations. We believe BPA would use these methods for calculating reserve amounts used in operations. It has been our intent to have the rate forecast for reserve requirements and the operational reserve requirements BPA plans to use during the rate period be based on consistent methodologies to the extent possible. This purpose will be frustrated if the two changes to the reserve forecast methodology are not included in the Final Proposal.

Q. Does this conclude your testimony?

A. Yes.

EXHIBIT 1

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Exhibit 1

DATA REQUEST NUMBER TO REFERENCE:
BPS-IR-1

RESPONSE BY:
Lara Skidmore - Iberdrola Renewables, Inc.

ORIGINAL DATA REQUEST:
Do you agree that there could be significant instances of Intentional/Persistent Deviation, consistent with the standard and definition set out is BPA-TS's Initial Proposal, without ever having a curtailment or feathering event under DSO 216?

EXHIBIT: Direct Testimony of Iberdrola Renewables TR-10-E-IR-01

PAGE(S): 8
LINE(S): 5-10

DATA RESPONSE: (NOTE: You MUST log in to the site in order to view any documents)

--TEXT DESCRIPTION:
Yes.

For technical questions about this request please contact Melissa Seymour by phone (5037967114) or email (melissa.seymour@iberdrolausa.com)

If you do not wish to receive notification of data responses from this system, please log into your account, select "Account" on the left hand menu and clear the checkboxes next to the setting marked "Email data response notifications."