BONNEVILLE POWER ADMINISTRATION

Customer Comments Regarding "Pricing Methodology for Generation Inputs for Regulating Reserves and Wind Integration"

Presented at the September 23, 2008, 2010 BPA Rate Case Workshop

The following are customer comments received from Renewable Northwest Project on October 7, 2008

RNP Comments on BPA's
Pricing Methodology for Generation Inputs
for Regulating Reserves and Wind Integration
Presented at the Customer Workshop held September 23, 2008

Renewable Northwest Project (RNP) appreciates the opportunity to provide these comments and the open spirit in which BPA offered its initial thinking on costing methodology for wind integration reserve requirements. RNP provides these detailed comments to support and detail concerns raised at the BPA Wind Integration Workshop on September 23, 2008. RNP urges BPA staff to carefully consider the comments provided below and reconsider the relevant portions of the proposed pricing methodology.

RNP's concerns detailed below address the following broad points:

1. The Embedded costs allocation method wrongly assumes that the incremental reserve requirements proportionally reduce BPA's sustained peaking capability.
2. The majority of BPA's wind integration costs accrue from the provision of down-regulation services, yet BPA transmission requires wind projects to limit generation as needed—effectively proposing to charge the wind projects for a service BPA is not providing.
3. The methodology fails to consider any cost differences among regulating reserve, following reserve, and generation imbalance products.
4. The methodology has no provision to differentiate between within balancing area generation for which no incremental following reserve requirements exist, and generation scheduled outside the balancing area.
5. Certain policy issues have not yet been addressed. Among these are the need for a tariff structure that provides incentive for minimizing integration costs and providing for technological innovation, basing rates on provision of services by third party suppliers, and the overlap of wind integration and generation imbalance tariffs.

The following comments detail RNP's concerns and suggest alternative means of addressing the perceived shortcomings. RNP believes that adequately addressing the issues raised will result in a fair assessment and allocation of costs, while ensuring an economic, efficient, and reliable power system.

1. <u>Embedded Cost Allocation and Wind Effect on Sustained Peaking Capbility</u>

BPA's preliminary estimate of costs associated with FY 2010-11 wind integration is approximately $137 million. Of this, $77 million or 56% are associated with an allocation of embedded hydro system costs. Embedded costs are therefore a very significant portion of the proposed rate and merit careful consideration. The rationale for the allocation appears to be to apportion fixed costs of the hydro system to consumers of 120-hour sustained peaking capability of the hydro system. As is described below, BPA's analysis did not properly evaluate the effect of reserves on sustained peaking capability. The predominant effect of reserves on sustained peaking capability is due to

down regulation, and RNP continues to urge BPA to look past PBL to supply those services.

The effect of following and regulating reserve requirements on sustained peaking capability is somewhat complex. It is not correct to assume that every megawatt of incremental generating requirements is equivalent to a megawatt reduction in sustained peaking capability. We note that the computation of sustained peaking capability is normally done using sophisticated hourly hydro dispatch models, and that the assumption of a reduction due to holding regulating and following reserves was not tested by BPA with such models.

In general, sustained peaking levels represent reductions in overall generating capacity (nameplate less outages) due to the depletion of water in the smaller reservoirs and run of river projects. Generation is maximized during the heavy load hours, and reservoirs replenished during light load hours to the extent possible given operating constraints (e.g., minimum flow requirements). Sustained peaking capability is designed to capture the hydro system's ability to meet heavy load hour demand over multiple hours and days ("sustained") and does not represent an upper limit on providing additional generating capability on any individual day, hour, or minute.

BPA's September 23 presentation (Slide 13) shows 7,900 MW of generating capability (labeled "Operational Peaking Adj.") beyond the sustained peaking capability, identified as 9,217.8 MW on that same slide. This amount dwarfs any incremental reserve requirement identified as needed for loads or wind. During heavy load hours, all of that amount would normally be available to meet short term (minutes or hours) increases in requirements due to unanticipated changes in wind—provided, that the energy used is replaced during the heavy load hours. On sub-hourly time scale fluctuations, the net effect is essentially zero over the heavy load hours since every need for increased generation is matched by decreased generation, which refills the reservoirs and leaves the system essentially whole.

The situation on light load hours is different. To the extent that holding and operating reserves results in greater overall flows during the light load hours, that energy is no longer available during the heavy load hours over which the sustained peaking capability is measured. Paradoxically, the dominant impact on sustained peaking capability is not the need for incremental generation on heavy load hours, but the need for decremental reserves during the light load hours. That need causes the system to pass more water during light load hours, especially when the wind is NOT blowing. The greater light load hour flows serve to reduce the sustained peaking capability during the heavy load hours. In RNP's view, this is the dominant effect on sustained peaking capability and would be born out by BPA's hourly models that are normally used to determine sustained peaking capability.

RNP views BPA's proposal to supply all wind reserves from the hydro system as uneconomic and inefficient. BPA calculates that 75% of its direct costs (opportunity and operational, excluding embedded) derives from the need to provide decremental reserves.

Further, a more detailed assessment of sustained peaking capability would allocate embedded costs primarily due to the need to hold *decremental* (not incremental) reserves on the hydro system. In RNP's view, it is imperative for BPA TBL to look to third party supply, including the wind generators themselves, to provide down regulation capability and obviate the need to allocate embedded costs for that purpose.

The situation is particularly egregious under high load events when wind tends to blow less due to the coincidence of large-scale high-pressure systems and temperature extremes. The effect is greatest in the hypothetical, but likely case where the wind is generally calm but BPA is "standing ready" by releasing significantly higher-than-minimum flows on light load hours in case the wind should suddenly increase. At a time when thermal generation in the region is high and could be displaced, loads are generally at their highest, BPA suggests it would flush water down the river at night on the off chance the wind might suddenly rise. It is unnecessary, inefficient, and uneconomic. In the alternative, a third party supplier such as an operating thermal plant, or the wind projects themselves, could be relied upon to provide the needed service at a much-reduced cost. In the alternative, the "stand ready" cost for a wind turbine to limit output on calm days would truly be miniscule.

Recommendations:

a) Down regulation needs to be supplied by a combination of third party suppliers and BPA.
b) Wind generation should be incentivized to offer third party down regulation services.
b) Embedded cost allocation must be based on the actual degradation of sustained peaking capability due to the incremental reserve requirement as determined by a study of the effect of incremental reserve requirements on sustained peaking capability.

2. <u>Charging for Within-Hour Services Not Provided</u>

As noted above, 75% of BPA's direct costs and the vast majority of the embedded costs (i.e., consumption of sustained peaking capability) are due to BPA's provision of down-regulation services—the ability to reduce generation within the hour as necessary to balance wind and load. BPA has repeatedly put wind schedulers on notice that the generators will be limited to their scheduled levels at BPA's discretion. BPA staff suggests that this has occurred ten times this year since spring. In essence, BPA is relying on the wind generators themselves to self-provide the down-regulation services that BPA seeks to charge them for.

There is no established protocol specifying, or in any way limiting, the conditions under which BPA will choose to limit the wind generators. BPA proposes to charge for a reserve requirement level covering 99.75% of all over-generation events without taking into account the provision of those services by the wind projects themselves, and for which the wind projects are not reimbursed.

RNP contends that the current situation, extrapolated into FY 2010-11 represents BPA charging for services it is not, and may not be capable of providing from PBL. Again, RNP advocates allowing the wind projects, and other generators or loads to bid down-regulation services to BPA. BPA should then select the least cost suppliers of the services at any particular time, and charge the costs incurred through the wind integration rate. The present proposal anticipates charging for services based on hydro system costs that are not economically provided by the hydro system, and may not be provided at all.

BPA must either reimburse the wind generators for limiting their output, or not charge them the down-regulation portion of the wind integration charge. It cannot both charge them and limit them without payment—it is tantamount to charging for a service that is not provided.

Recommendations:

a) BPA must establish clear conditions under which it will require wind generators to limit generation to scheduled amounts.
b) The conditions established in a) should not result in wind generation curtailments more than 0.25% of all hours.
c) Curtailments in excess of 0.25% should be deemed provision of down-regulation services and reimbursed by BPA.
d) If BPA does not enact recommendations a), b), and c), BPA should remove the down-regulation costs from the wind integration cost computation.

3. Differentiating Among Reserve Types

BPA's Transmission Business Line delineated three categories of reserve requirements: Regulation, Following, and Imbalance. The September 23 presentation treated all of these services identically in assessing costs. There are important distinctions among these products that need to be taken into account.

Imbalance Reserves

Imbalance reserves account for average differences between the schedules and actual generation levels for the hour. Historically, cost recovery for this product was accomplished through the Generation Imbalance tariff that is currently tied to prevailing hourly markets. In fact, much of the Imbalance reserve BPA calculates can be forecast in a timely enough manner to transact on hourly markets—due to the systematic error BPA assumes will continue in the provided schedules. That part of the Imbalance reserve that can be anticipated and transacted on hour-ahead markets should not be subject to the analysis provided in the September 23 presentation. RNP is working hard to eliminate the systematic scheduling errors, but if BPA persists in assuming that scheduling behavior into the future it must remove the part that can be transacted on hourly markets and charge it through the existing Generation Imbalance charge established for that purpose.

The remaining Imbalance reserves—those that cannot be transacted in the hourly market—should not be subject to Generation Imbalance tariffs. BPA staff has suggested that the Generation Imbalance tariff covers energy but not capacity associated with the Imbalance reserve requirement. RNP does not necessarily agree with that argument, but it is irrelevant, as the wind integration methodology comprehends both the capacity and energy effects of holding and operating reserves for Imbalance. BPA cannot charge both the generation imbalance tariff and the wind integration tariff for the Imbalance portion of the reserve unless it removes the energy cost considerations from its methodology. BPA cannot charge the proposed wind integration rate and Generation Imbalance without charging twice for the same service.

Following Reserves

Following reserve accounts for the within-hour balancing requirement that persists over periods of ten minutes or longer, but by definition nets to zero over each operating hour. Following reserves do not necessarily need to be provided by units under automated electronic dispatch ("AGC"). BPA contends that all of the within-hour balancing is provided by AGC units. RNP recognizes that this may well be the current operating practice of BPA (excepting the self-provision by wind generators noted above), but that it is not necessarily so. RNP continues to urge BPA to seek third party suppliers of both Following and Imbalance reserves as they can be provided by third parties. BPA experiences significant costs associated with providing down-regulation reserves whereas third parties (especially thermal units and loads) may experience cost savings by taking this energy.

Regulating Reserves

Regulating reserves respond to electronic signals to increase or decrease generation to balance the system on the timescale of a few seconds up to ten minutes. The rapid response makes this service traditionally the most expensive service to provide for most utilities. The need for incremental Regulating reserves to accommodate wind are quite modest, as wind does not vary significantly more than load on Regulating reserve timescales. BPA is likely the least cost supplier of regulating reserve. Provision of Regulating reserve likely does not significantly affect sustained peaking capability, and RNP urges BPA to consider offering such services to other balancing areas—potentially in exchange for other services such as down-regulation on Following or Imbalance timescales.

Recommendations:

a) BPA must remove any reserve requirement associated with schedule error in excess of 30-minute persistence forecast error, and charge that portion to Generation Imbalance.
b) Except for charges under a) above, wind generators paying the wind integration tariff should be exempt from paying Generation Imbalance.
c) BPA should take aggressive actions to assist wind schedulers in providing accurate schedules.

d) BPA should seek Following reserves from the most cost-competitive source, and not rely exclusively on the federal power system for those reserves.

e) BPA should determine the effect of Regulating reserves on sustained peaking capability without assuming each megawatt of incremental reserve requirement reduces sustained peaking capability by one megawatt—this is not likely the case.

4. Inside Versus Outside Balancing Area Reserve Requirement

As RNP has pointed out in previous comments, there is no incremental reserve requirement for services provided to wind generation delivered to loads within BPA's balancing area. The reason for this is that BPA's maximum obligation to its customers is their load—any wind that occurs reduces BPA's obligation, effectively freeing up generating capability for other purposes. If the wind is calm, or is suddenly calmed, BPA's maximum exposure remains the customer load.

The situation for wind generation exiting the balancing area is different. Wind schedules create an obligation on BPA's system that it would not have absent the wind. For example, if a wind project schedules 100 MW across the BPA system, but generated only 70 MWh on that hour, BPA retains an obligation to deliver the full 100 MW, incurring an incremental obligation (in this particular example) of 30 MW.

Recommendations:

a) BPA should not charge incremental Following and Imbalance reserves to generation scheduled within the balancing area.

Remaining Policy Issues

Missing from our "robust stakeholder input process" is an active discussion of important policy issues. RNP would like to engage BPA and other stakeholders at a serious and high level regarding the tariff structure, how third party supply costs can be incorporated into the tariff to ensure proper cost recovery, and the treatment of Generation Imbalance costs.

Tariff Structure

RNP views the development of an appropriate tariff structure as vitally important to laying a strong foundation for an efficient, economic, and reliable power system with substantial amounts of wind generation. BPA has properly and appropriately recognized the importance of wind schedule accuracy to the cost of providing wind integration services. A fundamental concern RNP expressed in the WI 09 rate case was that BPA's proposed methodology did not take account of the importance of wind schedule accuracy. The current methodology is much better aligned with RNP's understanding of the factors

contributing to wind integration costs. We remain concerned that the reserve requirements are vastly overstated, probably by a factor of two, due to the assumption that current poor wind scheduling habits are continued. RNP is committed to working with regional entities to improve the accuracy of wind schedules.

This is not a one-time only issue. The establishment of a rate that reflects increased costs associated with increased inaccuracy of wind schedules is a vital component to ensure that all participants in the wind integration rate pay their fair share, and that the reserve requirements are minimized to the extent possible. Absent a rate incentive, schedulers who have taken more care and who may have invested more in forecasting services will effectively subsidize the schedulers taking less care or who may not have invested in better wind forecasts. Improvements in forecasting technology will not occur without the explicit price/value signal sent by a tariff based on the actual cost of providing services. It would be very short sighted to omit this price signal, and thereby delay or eliminate the possibility of improvements in forecasting technology by driving out potential technology investments that would benefit everyone in the region.

BPA needs to actively engage other regional stakeholders in a collaborative effort to explore the range of tariff structures. The best choice will not likely be made without first exploring all the possibilities. To date, BPA's overriding interest has been in a tariff structure that returns a fixed and known revenue stream regardless of the cost incurred. RNP respects this view, but BPA and the region would be better served if BPA withheld judgment until alternatives can be explored. We recognize BPA's expertise in this field and look forward to participating in a creative process that may end up with a better solution.

Third Party Supply Costs

BPA appears to be set on a course of establishing a rate based on a theoretical calculation of hydro system costs associated with providing a level of reserves the hydro system does not possess and is not in fact currently serving in whole. It seems inescapable that a significant part of the reserve requirement will be served by third parties—for example, by the wind generators themselves through BPA generation limits. RNP encourages BPA to explore a path in which the tariff is based on some combination of PBL and third party supply of the generation inputs. If in fact this is BPA's ultimate objective, RNP encourages BPA to more clearly delineate how they perceive the process to work.

Generation Imbalance and Wind Integration Tariff Overlap

As previously discussed, RNP continues to hold that participants in the wind integration rate are paying all of the costs associated with accommodating generation imbalance, given the proposed costing methodology. BPA staff has asserted this is not the case, but there seems to be little analysis or argument beyond the basic assertion. RNP would like to engage at a higher, or at least deeper, level whether BPA intends to charge wind generators both Generation Imbalance and what rationale there may be for so doing.

Recommendations:

a) BPA should establish regular meetings of a policy group to engage in an open and wide-ranging discussion of these issues in a collaborative atmosphere to find what works best for BPA and the region.

Conclusion

The cost to BPA of integrating wind can be dramatically reduced through just two of a number of actions that can, and we argue must, be taken prior to the rate period. These two actions are:

1) Improvements in wind schedule accuracy.
2) Third party supply of down-regulation.

Using BPA's proposed methodology, these two actions would likely drop the estimated costs from a third to half of the preliminary estimates. The cost of not undertaking these actions is staggering—perhaps some $180 million of needless costs incurred by BPA and charged to the wind industry over the two-year rate period. RNP understands its own obligations to work toward this. We are actively engaging our own members, and other wind generation schedulers in the region to improve scheduling accuracy over the next few weeks. We have encouraged our own members and other potential regional suppliers to work with BPA to offer within-hour balancing services, particularly down-regulation.

There are many actions that can be taken to reduce the amount and cost of accommodating wind on the power system. These comments focus on the actions that can be taken with a high level of confidence prior to the beginning of the rate period and which effect the greatest reductions. Other actions can and should be taken as are outlined in the Northwest Wind Integration Action Plan. Assuming that the entire burden will or must be born by PBL leads to a conclusion that is inefficient, uneconomic, unnecessary. RNP urges BPA to work collaboratively with all regional stakeholders to achieve a reasonable, effective, and efficient wind integration tariff.