Northwest Power and Conservation Council

December 13, 2006

DECISION MEMORANDUM

TO: Council Members

FROM: Terry Morlan, Director, Power Planning Division
Wally Gibson, Manager, System Analysis and Generation
John Fazio, Senior System Analyst

SUBJECT: Decision on a Resource Adequacy Pilot Capacity Standard

PROPOSED ACTION: Accept the proposed changes to the Council's issue paper (document number 2006-18) and adopt the resource adequacy pilot capacity standard for the Pacific Northwest as described in the amended paper.

SIGNIFICANCE:

- Recent adoption of the energy bill gives the Federal Energy Regulatory Commission (FERC) authority to assess the adequacy of the nation's power supplies. We expect that the Western Electricity Coordinating Council (WECC) will be designated to assess the adequacy of the western power supply. We intend this proposed standard for the Pacific Northwest to be integrated into WECC's efforts.
- The Bonneville Power Administration (BPA) has been a joint sponsor of the Resource Adequacy Forum and intends to incorporate the standard in its Regional Dialogue and the ensuing contracts.
- The establishment of a regional resource adequacy standard will provide a consistent context to utilities, regulatory commissions, and public utility boards in their assessment of individual utility resource plans.

BUDGETARY/ECONOMIC IMPACTS:

- There are minimal effects on the Council's budget. At this time, there is no indication that additional funds would be needed for contracting work or for advisory committee member travel expenses.
- The regional economic benefits of establishing a resource adequacy standard could be significant. Historically, the region has experienced periods of surplus and deficit energy supplies. Neither situation is desirable from an economic point of view. The

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establishment of an adequacy standard will help minimize the number of times the region finds itself in a costly situation of too little or too much energy supply.

BACKGROUND:

Recent events such as the Western energy crisis of 2001, which led to both curtailments in California and to West-wide price spikes, have forced utilities and regulators to rethink their approach to planning and operating the power system. In that year, the Northwest experienced its second-lowest water year (based on historical records since 1929). Also, few new resources were developed during the late 1990s, leading to areas of resource deficiency throughout the West. Combined with a flawed electricity market design in California and apparent market manipulation, these factors led to the undesirable events of 2001. The Northwest is still recovering from the economic recession following that crisis.

The crisis demonstrated that the public has little tolerance for high and volatile market prices over a prolonged period. It also became clear that the financial community will not lend money for power-plant construction unless developers have power contracts in hand and/or utilities have included the costs of those contracts in their rates.

In an environment where an increasing number of parties will be taking on the responsibility for acquiring resources to serve regional load, a resource adequacy standard is key to ensuring overall regional sufficiency of resources to meet load at reasonable costs. The Pacific Northwest is unique, not only in the predominately hydroelectric nature of its resources, but also in the ratio of public utilities to investor-owned utilities (IOUs). Resource adequacy is more difficult to achieve in the Northwest for the following reasons:

- The ability to rely on wholesale electricity markets and surplus hydroelectric generation (in most years) can mask a condition of resource deficiency.
- The capital risk of constructing new resources in a market with substantially varying supply levels from year to year may be deemed too great for many developers.
- There is a continuing lack of clarity about the responsibility for resource acquisition among public utilities, BPA and independent power producers.

One way to alleviate the problem is to develop a regional resource adequacy standard and implementation framework. Such a standard would help utilities and their regulators gauge whether they have enough resources to meet their loads under a regionally accepted measure of generation sufficiency. A framework for implementing the standard would lay the foundation for those entities to plan for and acquire sufficient resources to meet load.

In its Fifth Power Plan, the Council recognized the importance of developing a resource adequacy standard and implementation framework. Action items ADQ-1 and ADQ-2 in the plan call for the establishment of resource information-gathering protocols and for the development of a resource adequacy standard for the Pacific Northwest. To achieve these goals, the Council and BPA instigated the Pacific Northwest Resource Adequacy Forum (Forum), with the intention that this group would develop a resource adequacy standard for the northwest.

ANALYSIS:

The Resource Adequacy Forum has been working on this task for the better part of a year. Analysis and documents, including meeting notes, are posted on the Council's web site at http://www.nwcouncil.org/energy/resource/Default.asp. The Forum is comprised of a technical work group and a policy steering committee.

The proposed standard consists of a metric (something that can be measured) and a target (an acceptable value for that metric) for both energy and capacity capabilities of the system. The standard is designed to be transparent and simple to understand. For the energy standard, an annual load/resource balance is proposed. The target for the load/resource balance is based on a more detailed and sophisticated analysis of the power system, which includes hourly as well as seasonal analysis. The standard is also expected to be flexible, in that the target will be adjusted as conditions in the energy markets change and as the region's ability to measure and analyze its capability improves. The Council adopted the energy portion of the standard in May of this year.

For the pilot capacity standard, a sustained-peaking capability is proposed (see the attached redlined version of Council document 2006-18). Like the energy standard, the capacity standard is comprised of a metric and a target. The capacity metric is defined as the surplus sustained peaking capability (in units of percent) and the winter and summer targets are 25 percent and 19 percent, respectively. The targets are made up of three components, an operating reserve, a reserve to cover adverse temperature and a planning adjustment reserve. The planning adjustment reserve is linked to a loss of load probability (LOLP) assessment and reflects a methodology similar to what was used in developing the energy standard. Both the energy and capacity targets are designed to yield a five percent LOLP when they are met.

ALTERNATIVES:

- One alternative is to not adopt a pilot capacity standard. This means that the region would continue to develop resources based only on energy needs. While this approach may have been sufficient in the past, recent analysis indicates that the region is quickly becoming (if not already) capacity limited in the summer. Without the benefit of an overarching strategy for both energy and capacity planning, the Northwest is more likely to experience periods of over- or under-building. Quantifying the potential regional cost of this alternative is difficult but based on past experiences it could be significant.
- A second alternative is to use a capacity standard developed by the WECC. The drawback to this alternative is that WECC has little or no expertise in planning for systems that are dominated by hydroelectric resources. The WECC capacity standard would not likely address Northwest needs in an appropriate way.
- A third alternative is to delay the adoption of a pilot capacity standard until further review and analysis is complete. It may appear to be prudent to delay this process (because the region currently has a large resource surplus), however, delaying this decision could affect the WECC process of developing west-wide standards and it clearly will affect BPA's efforts in its regional dialog. It is acknowledged that more work is required to validate the capacity targets but adopting the pilot capacity standard now would give it more credibility and would prompt more productive interactions with industry technical and policy staff.

ATTACHMENTS:

The recommended regional resource adequacy pilot capacity standard is presented in the attached paper. This recommendation was developed by the Pacific Northwest Resource Adequacy Forum and was unanimously agreed to by its steering committee. Modifications were made based on public comment received. A copy of comments received from the Bonneville Power Administration is also attached.

Northwest Power and Conservation Council

November 29, 2006

A Pilot Capacity Adequacy Standard For the Pacific Northwest

Council Document 2006-18
Redlined Version

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Northwest Power and Conservation Council

A Pilot Capacity Adequacy Standard for the Pacific Northwest

The Pacific Northwest Resource Adequacy Forum[1] (Forum) has developed a regional pilot capacity adequacy standard (to be used in conjunction with the previously adopted energy adequacy standard) for guidance in long-term resource planning. The Forum recommends that the Northwest Power and Conservation Council (Council) adopt this pilot standard as an interim guide for regional entities to inform their planning efforts with the understanding that the Forum will test and refine the standard and propose a final standard within a year. The Forum also recommends that this interim regional standard be submitted to the Western Electricity Coordinating Council (WECC) in order to inform WECC's ongoing process to develop West-wide adequacy standards.

The term "standard" in this context does not mean mandatory compliance nor does it imply an enforcement mechanism. Rather, it is meant to be a gauge used to assess whether the Northwest power supply is adequate in a physical sense, that is, in terms of "keeping the lights on." It can be thought of as the minimum threshold for resource acquisition.

The regional resource adequacy standard consists of a metric (something that can be measured) and a target (an acceptable value for that metric) for both the energy and the capacity capabilities of the system. One of these targets will be the limiting constraint for a region or sub-region in the West. For the Northwest, energy capability is most likely the limiting factor in winter but recent analysis shows that capacity might be the limiting factor in summer. However, the region is currently both energy and capacity surplus. Therefore, the Forum is comfortable recommending this pilot capacity metric and targets as an interim standard.

The Forum believes that the form of the capacity metric and the initial values of the capacity targets presented in this paper are appropriate. As the effort to test and refine the metric and targets progresses, the Forum will finalize the underlying assumptions and resource counting protocols. Within a year, the Forum will recommend the final regional capacity standard to the Council for adoption. Appendix A includes a draft work plan that is intended to identify remaining tasks required to finalize the capacity standard. However, even after the final standard is adopted, the intent is for this process to be dynamic. The Forum recommends that both the energy and capacity targets be re-evaluated on an annual basis to ensure that they continue to mark the threshold for an adequate Northwest power supply.

The Pacific Northwest Regional Capacity Standard

The capacity metric for the Pacific Northwest[2] is defined to be the planning reserve margin (PRM), which is the surplus *generating capability* over *expected peak load* during the *peak load hours* for each month[3] (also referred to as the surplus sustained-peaking capability), in units of percent, where:

- *Generating capability* is defined as the sustained peaking capability[4] from:
    - All non-hydro resources[5] (adjusting for fuel-supply limitations and/or environmental constraints and not counting resources on scheduled maintenance and assuming that no resource is on forced-outage)
    - Uncontracted in-region Independent Power Producer (IPP) resources: 100 percent in winter but in summer only that portion of IPP generation that may be accessible to northwest utilities during peak load conditions (1,000 megawatts will be used as a placeholder until better information is obtained)
    - Hydroelectric resources available to meet 1 in 2, or expected loads, based on critical water[6] conditions
    - Hydro flexibility (a conservative estimate of additional hydroelectric generation that can be provided over the peak load hours during a 1 in 20 year temperature event without invoking emergency actions): 2,000 megawatts in winter and 1,000 megawatts in summer
    - Out-of-Region spot market resources: 3,000 megawatts in winter and 0 megawatts in summer
    - The net of firm imports and exports into and out of the region
- The *peak load hours* are defined to be the same 10 consecutive hours per day over 5 consecutive days that yield the highest average load.
- *Expected peak load* is defined as the average load over the peak load hours, based normal daily-average temperature.
- Until better information is obtained, the capacity targets will be assessed using daily average regional temperatures and loads.

The pilot capacity target for the Pacific Northwest is 25 percent for winter and 19 percent for summer. The generating capability of the power supply in these months should be at least this much higher than the expected peak load over the peak load hours of the day. The capacity targets are comprised of:

- A component to cover operating reserve requirements: 6 percent[7] for both winter and summer, and
- A component to cover planning adjustment reserve[8] requirements: 4 percent for winter and 7 percent for summer, and
- A component to cover the load increase arising from a one-in-twenty year temperature deviation from the expected coldest/hottest day: 15 percent for winter and 6 percent for summer.

Endnotes

1. The Pacific Northwest Resource Adequacy Forum was created in response to action items ADQ-1 and ADQ-2 in the Council's 5th Power Plan (see www.nwcouncil.org).

2. The Pacific Northwest is defined to be the geographical area referenced in the 1980 Northwest Power Act, which includes the states of Oregon, Washington, Idaho and the western part of Montana.

3. The pilot capacity standard is in the form of a sustained peaking planning reserve margin (PRM), which can be calculated for every month. However, only the most critical month in winter and in summer are needed for resource planning purposes.

4. Peaking capability is the maximum sustained peaking capacity associated with the peak load period adjusted for fuel limitations or other operating constraints. For out-of-region resources, the peaking capability should be that portion of the resource that is contracted to serve regional loads. The Council's Natural Gas Advisory Committee will evaluate whether sufficient gas supply and transportation capacity is available to allow for counting the full peaking capability of the region's gas-fired power plants to meeting monthly or seasonal PRMs.

5. For the pilot standard, wind generation will be assessed at 15 percent of nameplate capacity.

6. For the region, under current operating constraints (including actions listed in NOAA Fisheries' biological opinion), the critical water year is defined by the hydrologic conditions from August 1936 through July 1937.

7. The 6 percent operating reserve requirement is an average for the region. The requirement calls for a 5 percent reserve for hydroelectric generation and a 7 percent reserve for thermal generation. The region's firm energy supply is almost equally divided between hydroelectric and thermal generation, thus the 6 percent average.

8. The planning adjustment reserve is derived from a loss-of-load-probability (LOLP) analysis. It is intended to protect against contingencies beyond those covered by the operating and adverse temperature reserves. The planning adjustment reserve tends to be higher during the summer when out-of-region supplies and hydro flexibility are less available. It is somewhat similar to the planning adjustment energy line item defined in the energy standard in that it is related to the northwest's dependence on non-firm resources, such as out-of-region supplies.

Appendix A

Resource Adequacy Forum Work Plan 2006-07
Revised by the Forum on 10/20/06

This work plan is primarily intended to identify remaining tasks required to finalize a capacity standard for the northwest. The schedule is tentative and will likely change over the course of the next year.

October 2006

- Steering Committee recommends a pilot capacity adequacy standard to the Council.
- Council votes to release the pilot capacity adequacy standard for comment.
- Council receives comments on the implementation approach.
- Technical Committee develops a set of assumptions regarding how resources are to be counted for energy and capacity adequacy assessments. Suggestions are made for revising the PNUCC reporting process.

November 2006

- PNUCC makes its annual request for resource and load data.
- Council votes to adopt the implementation approach.
- Council receives comments on the pilot capacity adequacy standard.
- Technical Committee begins development of a benchmark for the LOLP analysis.
    a. Technical Committee considers other tools as possible candidates for the LOLP analysis and/or to benchmark GENESYS LOLP analysis.
- Evaluate the appropriateness of the 5% LOLP based on tradeoffs between impacts of curtailments, cost of power and potential impacts to fish operations.
- Technical Committee begins reassessing the current LOLP definitions of what constitutes an adequate energy and capacity supply.

December 2006

- If the Technical Committee cannot reach a consensus on a final proposal for a reporting process, the Steering Committee will meet to resolve the issues.
- Council votes to adopt the pilot capacity adequacy standard.
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January 2007 through May 2007

- Technical Committee begins to explore economic targets for both the energy and capacity standards. This process will include examining the impacts to cost and to economic risk of changing adequacy targets.
- Technical Committee works to finalize capacity adequacy standard
    a. Council staff finalizes temperature/load relationships using the 50-hour duration rather than daily average temperatures for assessing the adverse temperature reserve requirement.
    b. BPA staff briefs the Technical Committee on suggested peak period durations for both winter and summer.

c. Technical Committee works with others to develop assumptions regarding wind resources.

d. Technical Committee reevaluates PRMs

- Technical Committee begins developing guidelines for interpreting regional energy and capacity adequacy standards for individual utilities.
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- Technical Committee reassesses the availability of surplus out-of-region resources to be used in the analyses.
    a. Fine-tune transmission assumptions
    b. Evaluate economic factors, which might dictate imports/exports depending on magnitude of shortages
- Technical Committee refines assumptions regarding the inclusion of uncontracted IPP generation in resource adequacy assessments.
- Technical Committee refines assumptions regarding the availability of hydro flexibility

- Technical Committee begins to explore the use of a "loss of fish operation probability" (LOFP) metric to assure that fish and wildlife operations are not unduly curtailed.
- Technical Committee checks that PNW Resource Adequacy Standards are consistent with NERC/WECC guidelines/standards.

June 2007

- Council assesses the region's resource adequacy (from a top-down perspective).
- PNUCC publishes its Northwest Regional Forecast, assessing adequacy from a bottom-up perspective.
- Results of the top-down and bottom-up assessments are compared.
- If necessary, Council evokes actions called for in the implementation approach.

July 2007 through August 2007

- Steering Committee considers guidance for interpreting regional energy and capacity standards for individual utility resource planning.
- Steering Committee decides on economic adequacy targets for energy and capacity.
- Steering Committee decides on assumptions regarding the peak duration period.
- Steering Committee decides on assumptions for out-of-region spot market availability, uncontracted IPP generation, wind generation and hydro flexibility for the top-down regional resource adequacy assessments.
- Steering Committee considers the use of a fish-operation reliability index to assure that PNW resource adequacy standards do not impose unreasonable risk to required fish operations.

September 2007

- Technical Committee prepares the final capacity adequacy standard and forwards it to the Steering Committee.
- Suggested changes to resource and load reporting are incorporated into PNUCC's process.
- Technical Committee reviews the energy adequacy standard to incorporate any revised assumptions adopted for out-of-region spot market availability, uncontracted IPP

generation, wind generation and hydro flexibility as well as revisions to the LOLP analyses.

October 2007

- Steering Committee decides on a final capacity adequacy standard to forward to the Council.
- Council votes to release the final capacity adequacy standard for public comment.
- Technical Committee recommends revisions to the energy adequacy standard, if any, to Steering Committee for consideration.

November 2007

- Council takes comments on the final capacity adequacy standard.
- Steering Committee forwards any revisions to the energy adequacy standard it approves to the Council for adoption.

December 2007

- Council votes to adopt final capacity adequacy standard.
- Council requests public comment on revised energy adequacy standard, if needed.
- Technical committee completes background documentation in support of the Northwest regional resource adequacy standard.

November 22, 2006

To: Northwest Power and Conservation Council

From: Paul Norman, Senior Vice-President, Power Business Line, Bonneville Power Administration

Subject: Comments on October 18, 2006 Council Document 2006-18, "A Pilot Capacity Adequacy Standard for the Pacific Northwest"

BPA appreciates the Council's leadership on resource adequacy. As BPA's customers take on more responsibility for adding resources to meet load growth, the success of this resource adequacy standards effort is key to assuring that the region continues to have an adequate power supply. Council members and staff have played an indispensable role in bringing the process this far.

The Region has traditionally not been overly concerned with capacity adequacy given the energy-limited nature of the Pacific Northwest's hydro-dominated power system. The energy-limited nature of the Region's power system necessitated the Forum's formulation of a capacity metric (i.e. a sustained peaking planning reserve margin (PRM) requiring a certain amount of energy support) unlike any other used in the North American Electric Reliability Council (NERC) footprint. Given the unique nature of the metric and the Region's inexperience in dealing with capacity adequacy, BPA supports the adoption of a pilot standard for capacity adequacy, recognizing the crucial need for testing, refinement and potential modification of the standard before it is finalized. Our primary comment is that we need to be serious about the "pilot" nature of this standard. We need to test it and be open to possibly making significant changes based on experience and further analysis.

One critical topic that we will have to address is the application of a capacity standard to specific utilities. BPA is committed to working with the Forum and the Council to ensure that this important issue is also completed in the coming year in a way that will facilitate an effective approach to individual reporting using common assumptions and definitions. The issue of comparability of the "top-down" and "bottom-up" assessments requires the development of common reporting protocols. Further changes to the pilot standard need to be evaluated in light of the ease of consistent translation of the regional standard to utility-specific resource planning guidance and the ability to create common reporting protocols.

The following paragraphs describe the areas in which we think further work on the standard will be essential once the Council adopts the pilot standard. The Forum's Technical Committee has already flagged many of these same topics as warranting additional study; in those cases BPA simply wants to point out specific issues to address and the importance we place on dealing with them.

Improvements to Loss of Load Probability (LOLP) Analyses

BPA supports the use of the Council's LOLP analyses to systematically evaluate the uncertainties associated with load and generation, specifically hydro and thermal generation, as a means of quantifying the summer and winter capacity targets. We recommend that the Forum carefully evaluate the following issues:

- **Thresholds:** On the one hand, the Council's GENESYS model counts as an energy event any season in which the sum of curtailments exceeds 28,800 MWh, or a loss of load the size of the City of Seattle for 24 hours. On the other hand, capacity events counted as misses include any season in which a curtailment exceeding 3,000 MW in any one hour occurs. Bonneville suggests that the definition of energy and capacity events be carefully considered. Specifically,
  - A capacity event should be reconciled with the sustained peaking duration that is utilized in the capacity metric. This will facilitate the eventual reconciliation of "bottom-up" and "top-down" assessments and help provide structure for the definition of a capacity event.
  - The Technical Committee should reexamine the nature of the curtailment events in the LOLP analysis and recommend a technical basis for the size and duration of an event. Ensuring that each of the selected events is comparable to the associated metric in the standards and technically sound will be important to avoid sending the Region inappropriate signals about the magnitude and nature of an adequacy problem.
  - As already discussed in Forum meetings, the Forum should follow through with some type of evaluation of the tradeoffs between the benefit of avoiding curtailments with the cost of additional infrastructure in selecting "significant events" to avoid from both a capacity and an energy standpoint.

- **Improvements/Calibration of the GENSYS Model:**
  - BPA supports the suggestion by Council staff to extend the analysis period of the model from the four months of the winter season to the entire year. In this way, the changing assumptions regarding the availability of uncontracted in-region merchant generation and surplus out-of-region capacity between winter and summer can be accurately reflected.
  - The assumptions regarding imports and exports between California and the Pacific Northwest should be coordinated with appropriate California entities, e.g. CAISO, California Energy Commission and/or California Public Utility Commission. Issues such as the CAISO's MRTU tariff provision (section 40.6.11), which allows unilateral curtailment of export self-schedules from bilateral trades under emergency situations, may undermine imports from

California as firm resources toward satisfying PNW resource adequacy standards. Through a more thorough understanding of the factors that may limit the availability of surplus winter capacity in California as well as an understanding of how much California relies on the PNW to meet their summer adequacy needs, the PNW can be better informed as it formulates out-of-region and within region market assumptions.

- We understand that the Trapezoidal Approximation model has recently been updated to reflect the current Biological Opinion. We encourage Council staff to routinely work closely with Bonneville staff in calibrating this model with varying degrees of "hydro flexibility".
- BPA needs a greater understanding of how the use of hydro flexibility in the GENESYS model potentially impacts Biological Opinion objectives. BPA and our Federal Action Agency partners need to have comfort with those assumptions.

<u>Linkage of Capacity Metric and Targets to Loss of Load Probability (LOLP) Analyses</u>

- **Ensuring linkage between LOLP and other Metrics/Targets remains Intact:** Given that the capacity metric reflects energy support, and is not a pure capacity measure; perhaps the most important metric for the regional resource adequacy assessments is the LOLP calculation. We think it will be essential for the Council to continue evaluating LOLP in its three-years-out regional resource adequacy assessments in addition to the energy and capacity metrics to ensure the standards are achieving the targeted loss of load probability.

- **Timing of Periodic Revisions to Energy and Capacity Targets:** Given the time required to go from an approved Integrated Resource Plan to actual construction of new infrastructure and the probable desire not to have to plan to a moving target; it may be beneficial to have stable energy and capacity targets (once the Capacity Adequacy Standard is finalized) for specific time periods. The Forum may wish to consider the issue of how often to update targets to provide for a stable resource planning and implementation environment.

- **Translating LOLP to Capacity and Energy Standards:** The objective in linking the LOLP results to simple energy and capacity metrics is to provide those utilities without the capability of using complex probabilistic models the ability to use the regional resource adequacy standards to guide their own resource planning efforts, especially once the Forum has developed utility-specific guidance. Although this linkage is desirable, following are issues, which still need to be addressed, when translating a

probabilistic LOLP analysis to deterministic energy and capacity metrics and targets:

- Although 50 water conditions are used in the LOLP studies, both the capacity and energy metric use critical hydro conditions to characterize the Region's hydro resources. The current method to bridge the two methodologies is through the use of planning adjustments. BPA believes the Forum should revisit the issue of characterizing hydro using other water conditions as a better way to accomplish this translation.
- The LOLP analyses are currently used to determine the overall regional sustained peaking Planning Reserve Margins (PRMs) for summer and winter; yet the building block approach suggests that the overall PRMs are the result of adding each of the building blocks together. BPA recommends that when the pilot standard is issued, it be accompanied by a clear explanation of the relationship of the PRMs to the LOLP. Without this explanation, the building block approach could lead to inappropriate decisions in the region if decision-makers believe that changes to Operating Reserves or weather variability will have a one-to-one impact on the PRM.
- As previously mentioned, thresholds that are consistent with the definition of the metrics are probably needed to better reconcile the LOLP analyses with the metrics.

□ **How to Count Hydro:** As previously mentioned, Bonneville has concerns that the results of the LOLP studies, which use hydro generation associated with 50 different water conditions, have been translated to energy and capacity metrics using critical hydro water conditions. Specifically, we believe that such a translation does not capture the contribution that better-than-critical hydro makes to the regional LOLP. After the pilot standard is issued we suggest the Forum engage in a discussion on how to assure that the "top down" and "bottom up" approaches toward adequacy are coordinated. Bonneville would also like to explore whether the capacity reporting period for the winter PRM (currently February) is consistent with the seasonal contribution of hydro to reducing LOLP.

□ **Duration of Sustained Peaking Period:** BPA suggests the Forum evaluate other durations, in addition to the sustained peaking period of ten hours per day over five days to cover a cold snap or heat wave event selected for the pilot standard, during the coming year. Especially for cold snap events, the span of time between peak times to fully cover both morning and afternoon peaks is about sixteen hours. The selection of the ten hour peaking period would appear to neglect significant market purchases to fill in resource needs in the peak periods outside the ten hour measurement period. A ten-hour peaking period may be appropriate to cover summer heat wave events.

- **Disconnect between Operating Reserve Component and Sustained Peaking Form of Metric:** The Pilot Capacity Adequacy Standard describes the three components of the PRM to be operating reserves, adverse temperature reserve and planning adjustment reserves. The PRM with 50 hours of energy support appears to be very compatible with two of these three components, i.e. the adverse temperature and planning adjustment reserves. However, operating reserves are not evaluated using energy support. They are required in the first hour of an event to maintain grid stability and avoid firm load curtailments. After the first hour, operating reserves are required to be restored. Therefore, the operating reserve component is not compatible with a sustained peaking capacity planning reserve margin metric, which requires 50 hours of energy support.

- **Need for Common Reporting Standards:** Another issue that will frustrate the ability to reconcile "top down" and "bottom up" regional assessments will be a lack of common reporting standards. Whether and how resources and loads are reported before or after common planning adjustments will be issues of potential variation. These issues include transmission losses, maintenance, outages, reserves, and diversity factors.

As the above comments and work plan indicate, there is much work ahead for the Forum in the coming year. We at Bonneville look forward to working closely with you and the Forum members to address these issues. Thanks again for your active leadership in this important effort.
