Final Draft

Resource Adequacy Technical Committee Meeting

July 5, 2006 – 9:30 a.m. to 2:30 p.m.

Notes

I Introductions and Review of the Agenda and 5/31 Meeting Notes

No changes were made to the 5/31 meeting notes.

ATTENDEES: John Fazio, Wally Gibson, Mary Johannis, Becky King, Aliza Seelig, Don Tinker, Clint Kalich, Stefan Brown, Dave LeVee, Rod Noteboom, Mac McCay, Chris Robinson

Capacity Metric and Target

John Fazio presented a PowerPoint entitled, "Resource Adequacy Capacity Target - Intuitive Approach." John reviewed the proposed capacity metric, which is in the form of a planning reserve margin (in units of percent), i.e. the amount of capacity in excess of that required to serve normal temperature loads divided by the capacity needed to serve normal temperature loads. The proposed capacity target is the percentage of planning reserves needed to account for at least three components, one for adverse weather, one for contingency reserves and one (possibly) for supplemental reserves. In the Pacific Northwest, capacity must be assessed over a multiple hour period (and over a number of days) due to the high percentage of hydroelectric generation. This is referred to as the **surplus sustained peaking capacity**. This definition of a planning reserve margin using the sustained peaking capacity rather than a single hour peak capacity makes the Pacific Northwest unique in its use of this planning metric.

Initially, sustained peaking capacity will be defined as 10 hours per day over a 5-day period. Rod Noteboom asked whether sustained peaking capacity should be defined assuming the enactment of emergency protocols? Mary Johannis responded that the Technical Committee concluded at its last meeting that sustained peaking capacity should be defined based on normal rather than emergency operations. Both the Technical and Steering Committees have agreed on the form of the capacity metric; however, the exact methodology for evaluating the capacity metric and the quantitative value of the capacity target are outstanding questions.

For the intuitive approach, a change was made to the metric to better define the outage uncertainty component. Outage uncertainty was replaced with the term "supplemental reserves for extended outages" to clarify that contingency reserves are used to meet loads during the first hour of an outage, but supplemental reserves are used to meet loads after the first hour of an outage.

II Temperature's Role for the Capacity Standard

A Defining "Normal" Temperature for Computing the Reserve Margin

John presented slides 5 through 7 of his PowerPoint, which depicted the 4-city daily average temperature profiles and exceedence curves for the Northwest. This data was used to

develop temperature statistics, representative of the PNW, to show the temperature deviations from normal for various frequency events in the winter and summer months. (See slide 8 – 9)

B Defining "Adverse" Temperature for Assessing the Capacity Target

The question for the Technical Committee is, **"What is the temperature deviation to which the capacity target should be planned?"** John's PowerPoint provided an analytical evaluation to attempt to answer this question.

Clint Kalich questioned whether using the most adverse daily average monthly temperatures over 80 years in the exceedence curves is statistically correct? Perhaps monthly exceedence curves should be developed using all daily averages in every month over 80 years?

Action Item:

- John will review whether Clint's suggested methodology provides different answers.

Rod asked, whether peak hour rather than daily averages should be used? Wally Gibson responded that daily averages correspond better to the 10-hour over 5 day sustained peaking capacity definition than hourly peaks.

John pointed out on slide 8 that a 1 in 20 year event corresponds to a 15-degree temperature deviation in January. Since the load changes are based on historical loads, Dave LeVee asked, whether these curves incorporate the effects of price elasticity, i.e. the effect of price on usage? John said that he did not believe so.

Action Item:

- John will check whether any price elasticity effects are included.

Mary questioned if the aMW unit on slide 10 is correct. The group concluded the units should probably be daily MW; specifically, this unit represents the daily average load in January for the daily average temperatures shown. Stefan Brown suggested better labeling of units and graphs here and elsewhere in the meeting materials.

John presented the results on slide 14, which indicated that the preliminary capacity target based on the intuitive approach should be 27% in the winter and 19% in the summer. A number of the meeting participants questioned whether this is too high a target. Several reasons why this target may too high include:

- Since the target is based on sustained peaking capacity over a number of hours, it is questionable whether the contingency reserves are strictly additive since contingency reserves are needed only for the first hour.
- Supplemental reserves for extended outages and temperature reserves may also not be strictly additive because the combined probabilities of extended outages and adverse temperatures may be very low.

- Helm data was used to develop the relationship between temperature deviations and increases in load over normal temperature loads. This data indicates a little less than a 300 MW load increase per degree deviation, which corresponds to the Northwest Power Pool's (NWPP) rule of thumb, except that the NWPP footprint is much larger than the PNW and includes the Canadian provinces of Alberta and British Columbia as well as all or portions of the states of Utah and Nevada.

Action items:

- Mary will research why reserve planning margin targets for areas within other NERC regions with predominantly hydro capacity actually go down compared to the rest of the area in that region, which is predominantly thermal.
- Mary will research how Federal hydro availability varies over different sets of durations and how much of the hydro capacity is actually used.

III Comparison of Sustained Hydro Capacity for Worst Case vs. Typical Cold Snap

Mary presented the results of Eric King's evaluation of the FCRPS and Mid-C sustained hydro peaking capacity under emergency operations to deal with a worst case cold snap and under normal operations to address a more typical cold snap. The decrease in sustained hydro peaking capacity for a 10 hour per day, five-day duration is more pronounced for the FCRPS, i.e. 2,200 MW than for the Mid-Cs, i.e. 200 MW. Stefan asked whether multiple events in a season should count as more than one occurrence in the LOLP calculation given that the hydro modelers pointed out the difficulty for the hydro system to respond to two cold snaps in one season?

Action Items:

- Eric King will explain why the decrease in Mid-C capacity is only 200 MW while the decrease in FCRPS capacity is 2,200 MW.
- Hydro utilities are requested to provide their sustained hydro peaking capability under normal operations for a 10 hour over 5 day operation in order to resolve the difference between the "top-down" and "bottom-up" aggregation of sustained hydro peaking capability.

IV Statistical Approach to a Capacity Target

John presented the PowerPoint entitled, "Resource Adequacy Capacity Target - Statistical Approach." In this presentation, John discussed basing a capacity target on an LOLP of 5% for capacity events. The key to this approach is defining a capacity event for the LOLP study. Slide 3 shows all of the curtailment events for a scenario that is adequate on an energy basis, i.e. energy LOLP=5%; none of the shown events appeared to be capacity-related. For purposed of this illustration, John defined a capacity event as a curtailment event whose magnitude was at least 3,000 MW and lasted multiple hours. John then increased the load in the base study by 500 aMW. The resulting energy LOLP (on slide 4) was 10%, which is less than adequate for the Northwest. Based on John's defined capacity event, this produced a capacity LOLP of 6%, which is, for the sake of this illustration, adequate. This conclusion confirms earlier results that planning to meet energy needs in the Northwest will lead to a surplus of sustained peaking capacity.

Action Item:

- John will add more labels to these slides, e.g. how many games were used in constructing slides 3 and 4.

On slide 7, John showed that the planning reserve margin associated with the study shown in slide 4 for a 10-hour sustained peaking capacity definition is 30%. This correlates well to the 27% planning reserve margin from the intuitive approach. However, Mary pointed out that a 30% planning reserve margin might be too high because the definition of a capacity event as 3,000 MW may be too low, given that contingency actions can add 5,000 to 6,000 MW of additional capacity in the region. A question arose as to the effects on other non-power constraints, primarily the winter fish and wildlife requirement to fill by early April. John pointed out that he could perform studies to assess the likelihood that these constraints would not be met. He has identified a Loss of Fish Operations Probabilities (LOFP), which is comparable to the energy and capacity LOLPs. Since language in the biological opinion allows the region to violate refill constraints under emergency operations and since the region can tolerate a 5% emergency occurrence (energy LOLP of 5%), it seems reasonable to allow a 5% limit for the LOFP also. More work on this effort is required.

Action Item:

- John will investigate what the LOFP is as the thresholds for capacity and energy events are changed in the LOLP studies.

V Decision on Capacity Metric and Interim Target

John asked whether there is sufficient comfort among Technical Committee members to pass on the draft capacity standard language to the Steering Committee for adoption. John indicated that zeroing in on the target might be easier if we take the intuitive approach. The committee must decide if a one-in-twenty-year event is what we should be planning for in terms of capacity needs. If so, then the portion of the capacity target to cover adverse weather can be defined from historical statistics (probably about 15% for January and about 10% for July). The contingency reserve requirement and the supplemental reserve requirement are more easily defined but the committee must make sure that there is no overlap in those requirements.

Action Items:

- Technical Committee members are requested to review the document entitled, "A Proposed Pilot Capacity Standard for the Pacific Northwest" and send any suggested revisions to John by July 14 to allow for a revised document to be discussed on July 20.
- Wally is going to check on whether contingency reserve requirements overlap with supplemental reserve requirements for the Northwest.
- The technical committee must decide whether to forward the language and the initial values for targets to the steering committee for consideration. This will be discussed on the July 20th conference call.

Counting Protocols

VI Data Requirements under Resource Adequacy Reporting Process

Mary briefly discussed possible changes to PNUCC's existing reporting process. This discussion evolved into an itemization of aspects of the reporting process, which need to be discussed at future meetings to reach closure as to how the PNUCC reporting process might change. Clint agreed to present information to help decide how wind capacity might be reported. Mary suggested asking the Corps to discuss how it models hydro for the PNUCC assessment.

VII Schedule Next Meeting and Adjourn

A conference call is scheduled from 9 – 11 a.m. on July 20; the goal of this call is to achieve consensus on the pilot capacity standard language and initial targets. The next regular Technical Committee meeting is scheduled for August 23 from 9:30 a.m. to 2:30 p.m. at the Council offices.

Action Item for John:

- John will send out instructions for how to use WiFi when meeting at Council offices.