

RA Technical Committee Meeting Notes

October 7, 2005

Wally Gibson suggested that the committee add an agenda item to discuss how the Federal power supply (Federal Base System—FBS) is computed, in relation to the Regional Dialog. It was decided that if time permitted, this would be discussed in the afternoon session.

John Fazio asked if there were any changes to be made to the notes from the previous technical committee meeting. There were no changes. There was some concern, however, about the relationship between the NW standard and the WECC standard and what would happen if the two were different. It was clarified that the goal is to have mutually compatible standards.

John Fazio summarized the September 16th steering committee discussion. He listed the four major principles that the committee agreed were important in developing a regional standard. He also identified a list of tasks that the steering committee outlined for the technical committee to look at.

Michael Schilmoeller made a presentation describing various planning metrics that were examined during the development of the power plan. He described the concept of coherence and how it was used to choose an appropriate metric to assess economic risk to the region. That metric, namely the Tvar90, is defined as the average cost of the 10 percent highest cost futures for any given plan (resource strategy). The desired resource strategy was developed by examining both the average cost and the economic risk for many different plans. Michael went on to say, however, that while this process was appropriate for developing a power plan, he did not believe that it should be used to assess regional adequacy. For one thing, this methodology requires the use of a complex computer model. Secondly, he suggested that it would be difficult to get all of the data required to perform an adequacy assessment. Michael suggested unused energy, LOLP or reserve margin as appropriate metrics to assess regional adequacy. He preferred the unused energy metric but agreed that the LOLP was reasonable. His least favorite choice was reserve margin.

Clint Kalich asked Michael what value he used for the cost of curtailment during the development of the power plan. Michael recalled using a value of \$250 per megawatt-hour. Clint suggested that that value might underestimate the societal value of curtailment. Some discussion ensued regarding the cost of curtailment. It was generally agreed that the cost of curtailment should somehow be incorporated into the adequacy assessment but no decision was made as to how to do that.

John Fazio made a presentation addressing some of the questions that had come up during the steering committee meeting. John reviewed how the Council currently calculates the regional LOLP. He then provided a crude assessment of the relationship between the LOLP target and cost. He also provided a chart showing the relationship between the LOLP and the curtailment threshold (used to compute the LOLP).

Generally, as the threshold gets lower, the resulting LOLP gets bigger. John then illustrated the types of curtailment events that were possible for a fictitious future scenario. In that scenario, the load/resource balance was deficit by about 1,000 average-megawatts, resulting in a 4 percent LOLP (calculated using the Council method). John went on to describe different methods of computing the LOLP for this same scenario. For example, counting only events that are at least four hours long and have total curtailment energy of at least 4,000 megawatt-hours, the LOLP becomes 10 percent.

A general discussion of the LOLP methodology followed. Someone suggested that the curtailment threshold is too high given that other regions use a ten percent target for LOLP. It was pointed out, however, that the Council's LOLP calculation takes into account more uncertainties than other methodologies: other regions typically use forced thermal outage as the only uncertainty; whereas the Council uses hydro, load and thermal forced outage as uncertainties in its LOLP analysis. The curtailment threshold is designed to screen out "insignificant" events, in other words, to eliminate the "noise" in the output.

At this point, the question of the accuracy of the Genesys model was raised. Has Genesys ever been benchmarked? For example, have any "back casts" ever been done to see how close Genesys comes to mimicking the real world? John answered by saying that back casts were very difficult if not impossible to do. He said that the monthly hydro simulation was based on a well-vetted model (BPA's HYDSIM model) and that the hydro peaking approximations were based on BPA's hourly hydro program (HOSS). However, a better benchmarking process should be explored. This will be investigated and discussed at a future technical committee meeting. Benchmarking Genesys is key if the region is planning to base its adequacy metric and target on Genesys studies.

It was generally agreed that using a load/resource balance as the region's adequacy metric is appropriate, as long as it can be linked back to a more sophisticated metric such as the LOLP. Is Genesys the right model to tie a load/resource balance metric and target to? Maybe we should use a model like AURORA? Alternatively, the region could use a simple mapping of load/resource balance to known regional power insufficiency situations to come up with a metric and target. (It was not discussed how this might be done).

John finished his presentation by looking at the relationship between the LOLP and total curtailment energy. He showed a graph of this relationship for a number of different previously run scenarios. Generally, as the LOLP increased, so did the total curtailment energy. However, it was not as precise a relationship as he had hoped (with an R-squared value of about 0.65). The comparison was made to show that just using the LOLP, without taking total curtailment energy into account, is not a bad metric to use. Michael suggested, however, that rerunning the scenarios with different resource mixes might make the relationship worse. Michael still believes that unused energy is a better metric to use than the LOLP. This is a topic for a future technical committee meeting.

The committee put together several tasks:

- Look into using another model to assess the region's LOLP, e.g. the AURORA model. (Clint Kalich)
- Vary the resource mixes in looking at the relationship between LOLP and total curtailment energy. (John Fazio)
- Identify what causes curtailment events in GENESYS. This might help define what a "significant event" is. (John Fazio)
- How do the results of GENESYS correlate with historical events or to other models such as Columbia Vista? How can we benchmark the GENESYS model? (John Fazio)
- Can transmission outages be modeled in Genesys? (John Fazio)

There were some issues regarding the assumption of California imports. John noted that generally, California would be surplus during winter (if they do their resource planning correctly). However, for summer needs, the northwest would be competing with California for resources. Thus, summer adequacy assessments should not include any available spot market imports from California. Although it was mentioned that spot market energy might be available from Canada during that time period.

John Fazio then described the Genesys methodology for calculating sustained peak capacity. The model simulates the operation of the hydroelectric system on a monthly basis. It also performs an hourly dispatch of resources, including hydro. To do the hourly hydro dispatch, the model uses peaking capacity curves derived from the Trapezoidal Approximation method. This method yields the approximate peaking capability of the hydro system for different lengths of time (2 hour, 4 hour and 10 hour periods). The peaking capability is tied to the monthly hydro generation. Thus, when Genesys is performing an hourly dispatch, it knows how much hydro energy is available to meet that peak demand. The committee again asked whether this process has been benchmarked. John responded that some of the data for the approximation came from BPA's hourly hydro model but he admitted that that link has not be re-examined for a number of years. The committee agreed that if Genesys is to be used, the peaking capability method should be re-evaluated.

When does the NW bump up against capacity limits?

- Forced outages of a number of large thermal plants
- Cold snaps when machine capability may be the limiting factor

What are the kinds of capacity events that need to be addressed by a capacity standard? Clint and Don indicated that cold snaps in their systems are the critical events.

The technical committee came to the following agreements (to be reviewed at the next technical committee meeting):

- Generally, the committee participants agreed that critical hydro is too conservative to be used in an adequacy standard.

- The committee agreed that the energy *metric* should be an annual energy load/resource balance, with a *target* of zero assuming average loads, no imports and some level of adverse hydro. The assessment of what adverse hydro condition to use will include the level of protection desired, i.e. physical or economic. The selection of adverse hydro will be based on an acceptable LOLP, but the Genesys model needs to be benchmarked, or perhaps another model needs to be used. But the committee agreed that using a load/resource balance and linking it to a more sophisticated metric is appropriate.
- The committee agreed that the capacity metric for the northwest should be defined using the *sustained peaking* capacity of the system. They also agreed that sustained peaking capacity should be calculated for 10 hours per day over a 5-day period. Some asked whether the capacity or the energy metric would be the binding parameter. It was suggested that someone do research in this area but it doesn't really matter since the WECC wants a metric and target for both. The committee also agreed that BPA could provide the initial estimates for the capacity assessment but ultimately it should be a neutral party, such as the NWPP.
- The committee will continue to look at other models to make sure that the analytical basis for selection of the adverse hydro condition is sound and to figure how it might change over time.

COUNTING RESOURCES:

How should the region count wind? Someone suggested that the contribution of wind to sustained peaking capacity could actually be more than its contribution for single hour capacity. AVISTA did a study that showed wind contributed 25% of installed capacity to their system. The committee decided to use 20% of installed capacity to represent wind sustained peaking capacity. The energy contribution is assumed to be 30%, or monthly average if historical data is available.

How should the region count generation from independent power producers (IPPs) or from utility resources used primarily for peaking (and thus are used on a very limited basis)? The consensus was to take the full availability of these resources minus emissions restrictions for energy calculations. Calculations should assume that fuel would be available. Capacity would be calculated for the sustained peaking period, but most likely the installed capacity will be used.

NEXT MEETING: November 2, 2005: 9:30 to 2:30 at the Council offices