Northwest Power and Conservation Council

July 28, 2005

MEMORANDUM

TO: Council Members

FROM: Terry Morlan

SUBJECT: July 18 Power Supply Event

Council members have asked for a briefing on the July 18 "near miss" of a power shortage on the Bonneville system. A representative from Bonneville will brief the Council on the event Wednesday afternoon at the August Council meeting in Missoula.

An attached memorandum from John Fazio describes the event in very general terms and answers some questions that Council members could have about the event and may want to explore further with the Bonneville representative. These questions include:

- What contributed to this problem?
- Why did Bonneville have this problem when the Council's analysis shows that the region is surplus?
- Could the region face the same problem again?
- Are there procedures in place to deal with situations like this?
- What happens if such problems cannot be solved and there is an actual power shortage?

Attachment

q:\tm\council mtgs\aug 05\power event cm.doc

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MEMORANDUM

TO: Council Members

FROM: John Fazio

SUBJECT: Bonneville's Near Miss on July 18th

On the morning of Monday July 18th, the Bonneville Power Administration forecast possible energy shortfalls for that afternoon's peak demand period (between 3 and 5 PM). The potential crisis was avoided, at least in part, by spot market purchases (ranging in cost up to $130/megawatt-hour) and by generating more out of the Willamette hydroelectric projects. Court-ordered bypass spill was not curtailed. A representative from BPA will brief the Council on the events of that day and on measures they have in place to deal with such emergencies.

How can Bonneville have a problem when Council analysis shows that the region is surplus?

First, the Council's forecast is for the region not for Bonneville's system. Second, it is an estimate of *annual* energy load/resource balance. Monthly assessments of supplies are generally lowest in winter and in late summer when demands tend to be highest. Third, the regional assessment includes generation from independent power producers (IPP), which amounts to about 3,000 average megawatts. Take away the IPP generation and the region is deficit (for example, see the Northwest Regional Forecast of Loads and Resources at www.pnucc.org). For Northwest utilities, the IPPs are considered part of the West Coast wholesale electricity market even though they are located inside the region. The Council's reliability analysis assumes that during an emergency IPP output could be purchased by Northwest utilities.[1]

Why did Bonneville have a problem?

Looking at Bonneville's tabulation of loads and resources in the latest White Book[2] (http://www.bpa.gov/power/pgp/whitebook/whitebook.shtml) shows a surplus for both July and August assuming critical water (1937) conditions and average temperature demands. However,

[1] The Council did not assess any potential within-region transmission constraints that would affect the deliverability of IPP generation.
[2] Technical Appendix 1, page 79

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river flows in July and August of 1937 were higher than projected flows (and generation) for this July and August. Also, the temperature on Monday was above normal for the region, causing demands to be higher than usual. The court-ordered bypass spill also effectively eliminated any available capacity from three of the lower Snake River dams and McNary Dam. The operating range for storage elevation at these projects is limited to about one foot under the biological opinion, however, they could provide as much as 1,500 megawatts of additional capacity over a 2 hour period, if not for the court-ordered spill. Making these adjustments[3] to Bonneville's power supply assessment greatly reduces its forecast surplus for this July and August. Another extremely hot day could deplete Bonneville's resources and put it in a position similar to what happened on July 18th.

Could the region face the same type of problem?

The Council's current analysis (using critical hydro and normal demand) shows the region to be surplus over July and August. Taking into account lower river flows, higher than normal demands and the loss of generation due to the court-ordered spill, however, greatly reduces the regional surplus. Because most of the regional surplus is attributed to IPP generation, if that generation is not available or if it is committed to out-of-region utilities, the region could face a shortfall.

A better metric to assess the adequacy of the northwest supply is the loss-of-load-probability (LOLP). A recent Council analysis (including the court-ordered spill) shows that the LOLP over the July-August period is about 4 percent. While that value is below the currently used Council standard of 5 percent (meaning that we have an adequate supply), there remains a non-zero likelihood of a shortfall. Under the right combinations of events -- unusually high temperatures, an outage of one or more generating resources and/or lower than expected river flows -- the region may have difficulty meeting all of its demands. Having an adequate power supply does not mean planning for 100 percent reliability -- that would be too costly.

Are there any procedures in place to anticipate such problems?

Generation schedulers for each utility review load and resource status on a daily (and hourly) basis. Forecasts for potential shortfalls are generally known a day in advance, which gives a utility time to secure more generation. Utilities first review what idle resources of their own they may be able to bring on line. This might include delaying scheduled maintenance on one or more units. In addition, for utilities with hydroelectric projects, it might mean drafting their reservoirs beyond the normal limits for a short period of time. A utility may also have a demand-response policy in place for such emergencies, which would temporarily reduce demand from participating customers. Lastly, a utility could purchase generation from utilities that are surplus (either within or outside of the region). This process assumes that each utility will properly forecast its own needs and have a plan of action in place when a shortfall is forecast.

On a regional basis, utility resource and demand information is sent daily to the Northwest Security Coordinator, who then forwards it to the WECC. After aggregating all of the data, if the security coordinator observes a potential shortfall, a conference call among all of the control

[3] The adjustments include this year's low river flows, implementation of the court-ordered bypass spill and unusually high temperatures (with associated high loads).

areas is initiated. Representatives of all the control areas then review the submitted data for accuracy. If the problem persists, an attempt is made to solve it within the region. Short of that, a look at the availability of out-of-region supply is made.

What happens if there just aren't enough resources to go around?

In the case of a very severe problem, whether caused by a shortage of resources or the loss of a major transmission line, the security coordinator has the authority to shed load in order to protect the bulk transmission system and avoid cascading outages. In this case, part of the network will be curtailed until remedies can be found. While this is a severe action, it avoids a more devastating outcome.

If a utility finds itself short and cannot acquire sufficient generation to serve all of its demands, it will be forced to implement its emergency curtailment operation. Each utility (including Bonneville) has such a plan, which identifies a priority list of customers that will be curtailed. These plans have already been developed and are periodically reviewed to account for system changes. While this may seem to be an extreme measure, it is a much more acceptable option than an uncontrolled outage.

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