



Department of Energy

Bonneville Power Administration
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CORPORATE STRATEGY

September 14, 2010

In reply refer to: S-7

To: Bonneville Power Administration Customers and Interested Parties:

The Federal Columbia River Power System is operated for multiple public purposes, including flood control, irrigation, power production, navigation, recreation and municipal water supply. The system is also operated to protect the river's fish, including salmon, steelhead, sturgeon and bull trout listed as threatened or endangered under the Endangered Species Act. The U.S. Army Corps of Engineers and Bureau of Reclamation, which own the federal dams, operate them within constraints established to assure the requirements of all the multiple purposes are met.

The Bonneville Power Administration (BPA) markets power from the federal dams within the constraints and requirements for other river purposes. Flood control, protection of fish listed under the Endangered Species Act, compliance with the Clean Water Act, and other requirements take precedence over power production.

As part of its mission to market federal hydropower, BPA is the primary high-voltage transmission provider in the Columbia River Basin. Consistent with Federal Energy Regulatory Commission policies for open-access, non-discriminatory high-voltage transmission, BPA integrates new power sources into its transmission grid that request such service. In the past few years, there has been remarkable growth in wind power projects interconnecting to BPA's transmission grid, driven by renewable portfolio standards in Washington and Oregon and increasingly by California's 33 percent renewable portfolio standard. As a result, generating capacity is being developed in the Northwest far in advance of regional power demand.

Due to the wide seasonal and annual variations in Columbia River streamflows and the high variability of wind power output, BPA has been aware for some time that a combination of high streamflows and high wind could pose new challenges for Columbia River system operations. This expectation was fulfilled when high streamflows emerged in a short period this June in an otherwise low-water year.

The large, sudden runoff highlighted a set of emerging operational issues that have implications for the many utilities and interests involved in the interconnected and interdependent Columbia River power system. The attached report describes how BPA worked with others throughout the region to fulfill fish protection requirements and maintain power system reliability through this high water event.

Although high spring runoff events are not unusual, operating the Federal Columbia River Power System through those events has become much more complex in recent years. In addition to high streamflows, operators now must also manage for 1) multiple flow and storage requirements to

protect threatened and endangered salmon and steelhead runs under the current Federal Columbia River Power System Biological Opinion and Clean Water Act; 2) changing uses of the transmission system; and 3) the addition to the region's generation mix of a significant amount of variable, non-dispatchable wind power with operating economics that are significantly impacted by production tax credits and renewable energy credits.

The high runoff event this past June was likely a preview of situations BPA and the region will face again. Between hydro and wind power, the Northwest is fortunate to have far more renewable energy on line than most regions, but the nature of renewable energy is that you cannot always control its availability. As new variable resource amounts grow, we will need specific techniques to make the best use of all our renewable resources through high runoff events while maintaining power system reliability, protecting other valuable natural resources such as fish, and ensuring equitable outcomes.

The report describes actions BPA took in partnership with the U.S. Army Corps of Engineers, Bureau of Reclamation, Energy Northwest, Northwest and California utilities, B.C. Hydro, wind power operators, and other parties. The report does not evaluate the tools BPA and other regional entities used or discuss other options that might be used in the future. Our intent is to present existing operational data as context for a regional conversation on how BPA and other stakeholders should approach future high hydro flow events combined with rapidly expanding amounts of variable renewable resources.

The fundamental operational challenge is managing an oversupply of power on some hours compared to load while maintaining safe water conditions for migrating fish. When high flow events produce significant amounts of energy and wind also coincidentally injects significant amounts of power into the BPA grid, the combination creates more power than there is load on some hours. Under current operating procedures, wind power automatically displaces federal hydro generation and forces the spill of water as it bypasses federal hydro generators. This increased spill of water causes dissolved gases in the Columbia River system, which at high levels can exceed FCRPS Biological Opinion and Clean Water Act requirements.

The report focuses on a two week period in June, but the effects of this high runoff event lasted through the month. BPA is concerned that in a heavy water year, similar conditions could impact operations for a month or more. This concern is amplified by the forecasted interconnection of 3,000 additional megawatts of wind generation capacity to BPA's system over the next few years.

BPA is participating in a set of initiatives aimed at better managing wind generation given the physical and operational constraints of federal hydro and transmission system operations. These include self-supply of generation balancing reserves and intra-hour scheduling. Although they offer promising outcomes, the effectiveness of these initiatives is still unproven, and they are unlikely to alleviate all of the issues associated with combined high wind and hydro conditions. It is likely that other operational, policy, and infrastructure solutions are going to be needed to manage the system in a reliable and equitable fashion during future runoff events.

For example, a major tool BPA used to manage through the June event was displacement of thermal resources with federal hydropower, including action by Energy Northwest to reduce its Columbia Generating Station nuclear plant to the lowest possible output level. If, in future high water events, BPA is not able to displace enough thermal generation to meet fish protection requirements, it might prove necessary to displace or re-dispatch wind generation.

We also expect to discuss the issue and impact of negative prices in the energy market. During the June event, BPA managed to avoid paying negative prices when it was displacing other generators with federal hydro power. Generally, thermal generators receive an economic benefit when they displace their generation with low cost federal hydro power because they avoid higher fuel costs. In contrast, wind generators stand to lose their renewable energy credits (and if applicable, production tax credits) if their output is displaced or re-dispatched by federal hydro power. Thus, the economic impact of displacing wind may lead to negative prices. It is not clear that persistent negative prices in Pacific Northwest surplus energy markets are the correct public policy outcome for this region, or that the unintended consequences of variable production incentives have been adequately addressed. New thinking and new policy solutions are likely necessary to address these issues.

BPA will use the attached report as the starting point for a series of regional workshops over the next several months to discuss high runoff and wind scenarios and to explore operational and policy mitigation mechanisms with stakeholders. The first workshop is scheduled for 8:30 a.m. to 12:30 p.m., Thursday, October 7, in the Rates Hearing Room adjacent to BPA headquarters in Portland. We invite your participation.

If you have any questions or comments on the enclosed paper you would like us to consider as we prepare for this workshop, please send them by Monday, September 27, to Steve Kerns at skerns@bpa.gov or at BPA-PSPG-5, P.O. Box 3621, Portland, OR 97208.

The Northwest has a long history of working together to make optimal use of its renewable resources for the good of the region's economy and environment. We look forward to working closely with interested parties to identify options and find appropriate solutions for future high runoff events to make the best use of today's and tomorrow's clean energy resources.

Sincerely,

/s/ Elliot Mainzer

Elliot Mainzer
Executive Vice President, Corporate Strategy
Bonneville Power Administration

Enclosure: (1) Columbia River High-Water Operations Report