Guide to Tools and Principles for a Dry Year Strategy

Introduction

In August 2002, following the events of the energy crisis of 2000 and 2001, Bonneville Power Administration (BPA) issued a draft *Guide to Tools and Principles for a Dry Year Strategy* (Guide). This draft was released for public comments with a closing date of October 30, 2002. The Guide is now finalized. It incorporated the comments that BPA received on the draft document and the experiences of the past three years out of four that have had below normal Columbia River run-off (measured October through September at The Dalles).

The 2002 Guide was intended by BPA to, "guide it through future critical periods marked by abnormal conditions such as drought, volatile market prices, and/or significant reductions in the availability of power to BPA." The final dry year strategy has not deviated from this strategy, but the final document has been streamlined to clearly define the scope of the strategy, clarify the principles, and to keep the dry year tools section as a "living document" so that they can be updated as circumstances warrant.

See the *Guide to Tools and Principles for a Dry Year Strategy* [Draft August 2002] for the recap of the events of 2001 that led to the development of a strategy for future dry years.

http://www.bpa.gov/power/pgp/dryyear/

Scope

As shown in Figure 1, dry year tools can be used in conjunction with or in lieu of Fishery Operations to either temporarily increase the energy supply or to reduce the load demand. This Guide focuses only on the formulation of dry year tools and the principles for meeting the load obligation and not on the role or application of Fishery Operations. The alternatives of meeting the shortage using fishery operations are addressed in other forums (see salmonrecovery.gov and the Emergency Protocols of the Army Corps of Engineers Water Management Plan (nwd-wc.usace.army.mil/tmt/documents/wmp/)).

Most electric utility systems, comprising primarily of thermal plants (nuclear, coal, gas) hardly ever face a shortage of energy. What they do face is a shortage of peak-generating capacity, which can be defined as the instantaneous amount of generation that a system can provide. "The Pacific Northwest, however, relies on hydroelectric generating plants for about two-thirds of its electricity use. In a bad water year we can find ourselves with generating capacity for our peak hours, but without enough water (fuel) to provide the total electricity needed over the whole year." [5th Northwest Electric Power and Conservation Plan – Volume 2 Section 4 Resource Alternatives Demand Response pg 4-6] This document can be accessed at:

http://www.nwcouncil.org/energy/powerplan/plan/Default.htm

This Guide is a proactive planning effort to ensure that BPA is prepared to meet the load obligations in a cost-effective manner should another dry year occur with all or some of the characteristics of the energy crisis of 2000 and 2001. Most important, these are energy tools and principles needed to temporarily solve (up to one year) an energy shortage due to the lack of water (e.g., energy) or the unanticipated loss of generation (for example, if the Columbia Generating Station trips off-line for an extended period of time). However, the Guide is not designed to solve capacity problems (peak system usage) due to transmission, non-power uses, or other constraints nor is it designed to plan for long-term purchases of resources for the Federal Columbia River Power System (FCRPS).

BPA's load obligations are fairly well defined in power sales agreements with its public utility customers. The majority of these contracts expire in 2011. BPA is currently engaging its public utility customers and stakeholders in the Regional Dialogue process to determine what BPA's load obligation will be post-2011. In addition, this process will determine if BPA or the customers will be responsible for augmenting generation supply for load growth. Therefore, this document will need to be updated once these obligations are defined. First and foremost, the Guide is focused on meeting BPA's short-term load obligations.

In the past three water years out of four were not catastrophically dry and there were no major unscheduled plant outages, there was however a significant reduction in secondary sales. Secondary sales can be defined as energy sales in power markets that are sold at market prices when BPA has energy inventory above that needed to meet its existing load and other contractual obligations. These secondary sales are credited against power costs to reduce electric rates to BPA's customers. Therefore, dry years also reduce BPA's ability to meet load obligations in a cost-effective manner.

Triggering Conditions for the Guide

Throughout the year BPA incorporates into its regular planning the periodic review of these tools. BPA may also review the Guide in response to specific events that have the potential to impact federal or regional load resource balance. Over the past several years, it has been impossible to create, in advance, a meaningful and prioritized list of events that would trigger the use of dry year tools. The individual circumstances associated with a dry year and the relative cost and availability of tools all impact the appropriate response. Therefore, the use of the dry year tools can be used any time to temporarily solve energy shortages that threaten the ability of BPA to meet its load obligation subject to the following dry year principles.

Dry Year Principles

The dry year principles serve as the overarching criteria for decisions regarding what tools are used to meet the load obligation in a cost-effective manner. These criteria are intended to embody the most important mandates contained in the 1980 Northwest Power Act as well as other important legislation governing FCRPS operations. The challenge BPA confronts is choosing dry year tools that allow BPA to meet its load obligations while balancing these underlying principles. BPA, in coordination with the Federal Action Agencies (U.S. Army

Corps of Engineers and the U.S. Bureau of Reclamation) and other regional stakeholders, when feasible, will attempt to satisfy the set of principles in a balanced fashion. It is understood that the tradeoffs are unavoidable when operating a large, complex hydropower system that serves multiple purposes.

BPA will make decisions on what dry year tools to pursue to maintain power system stability and reliability while meeting other statutory responsibilities, including responsibilities to:

- Balance both non-power and power uses during the energy shortage;
- Maintain federal trust responsibilities;
- Protect fish and wildlife consistent with Endangered Species Act; the 1980 Northwest Power Act, and other laws;
- Act in a sound and business like manner;
- Provide an adequate, efficient, economical, and reliable power supply;
- Provide a cost-effective solution to the energy shortage to maintain rates as low as possible to minimize the economic impact to the region and the FCRPS.

Timeframe

The scope of this Guide is applicable to fiscal years up to 2011 when the current power sales contracts expire. The ongoing Regional Dialogue process with BPA's utility customers and other stakeholders lays out what load obligations BPA will have after this period. Once the Regional Dialogue has established this obligation and new power sales contracts are in place, these energy shortage tools and load obligation principles will be reassessed.

Dry Year Tools

Dry year tools have been updated since the draft was sent out for public comment in October 2002. This section of the Guide is considered a living document. The potential tools, the quantity available of increased generation or reduced demand, and the price will be evaluated once the dry year is triggered. The tools have been arranged alphabetically rather than by the quantity of the resource available or the price of the resource. The potential for these resources are fluid as well as their prices and therefore will have to be evaluated once a dry year is triggered.

(1) *Columbia Basin Project Water Conservation*. Enter into agreements with the U.S. Bureau of Reclamation and the irrigation districts to leave project land fallow, capped at some percent in order to limit disruption to the local agricultural economy. Approximately 4 acre feet of water per acre of land left fallow would remain in the mainstem Columbia River to improve flows and increase power generation. This would also save energy by reducing energy consumed pumping water into Banks Lake from Roosevelt reservoir. This program has to be triggered early in January/February before investments and contracts are entered into by irrigators.

(2) *Direct Service Industry* (*DSI) Load Buy-down*. DSIs no longer purchase power directly from BPA, but receive a capped financial benefit based upon their level operation and other criteria. DSI are also currently operating at levels substantially below historical levels. These two factors limit the potential amount of load reduction that could be achieved.

(3) *Distributed Generation*. During the power crisis of 2000-2001 several load-following customers developed small generation plants or some of their end-use industrial customers may have idled generation. For these customers the ability to sell the output over the transmission network and providing the necessary ancillary services for the generation may be prohibitive. BPA can enter into agreements with these customers to purchase the output from these generation plants.

(4) *Energy Efficiency*. Three energy efficiency programs could by implemented relatively quickly: compact fluorescent bulbs, Irrigation Scheduling, and commercial pre-rinse valves.

(5) *Industrial Load Buy-down.* The four largest industrial end-use consumers of BPA's load-following customers consume approximately 400 average megawatts total. There may be opportunities to either substitute market purchases for energy intensive processes (such as buying market pulp as opposed to grinding it on site) or to temporarily shut down processes or machines. The price and quantity of opportunities depend in part on the economic conditions of the commodity products that these mills produce.

(6) *Irrigation Load Buy-down*. Enter into agreements with BPA's eastside load-following customers to reduce irrigation pump load (either aquifer or surface water lift). Note that this program has to be triggered in January/February before investments are made in planting.

(7) *Market and Option Purchases.* There are power products available in power markets that can be used to meet BPA's load obligations but prices and quantities available may not always be advantageous.

(8) *Power Exchanges.* Power from one utility is exchanged for power from another utility system. Utilities may have unique load and resource characteristics that make energy trades advantageous. For example, California generally has peak load in the summer while in the Pacific Northwest loads (in the major west side load centers) peak in the winter.

(9) *Public Awareness Campaign.* This can be acted on alone or the first step before a Regional Curtailment is enacted. The amount of energy conserved by eliciting public requests is hard to quantify, but it has been estimated at around a 5 percent. The amount of energy conserved is also not only unpredictable, it is usually only for very short-term periods.

(10) *Regional Curtailment.* Coordinate with regional governors to exercise emergency powers to impose mandatory load curtailments.

(11) *Storage Agreement.* Storage agreement is between BPA and Canada (or other utilities that have storage capability) to store water in Canada to improve reliability in a following period. This would reduce power production in one period while increasing it in another. The agreement could be reached quickly, but it takes time to store the water for energy production.