

ISSUES

Reliability and the Future of Transmission Costs

Transmission Business Line Capital

Today, the Bonneville Power Administration's transmission system is operating at near capacity. That is partly due to growth and partly due to increased use of the system because of competition. In Seattle alone, growth that would consume about 200 megawatts each year is having a profound affect on the transmission system. Because of competition, the use of TBL's system since 1993 has increased from about 300 transactions per day to over 2,500 today.

While TBL has made a major effort to cut costs in the last six years, those cuts were largely possible because of the margin of capacity it had built into its Northwest transmission system. Now, however, the margin that TBL had built in has been used up and it again needs to begin reinforcement activities. Those activities will cause costs to rise.

While not part of the fiscal 2002-3 transmission rate case, this discussion of what TBL is spending on its programs will inform the rate case. TBL invites your comments, and suggest that you consider the following questions:

- Are there areas where TBL should be spending less or spending more?
- Do the programs address your needs?
- Has TBL found a good balance between managing costs and the need for reliability and open access?

HISTORY OF CUTS

In the late 1980s, public pressure led BPA to rethink how it will provide transmission capacity in the future. In response to rapid growth in Puget Sound, BPA looked at the traditional solution – more transmission lines across the Cascade Mountains. Due to public pressure against this alternative, BPA looked at other ways to meet load growth. Local power generation, demand side management and lower cost transmission alternatives were investigated. Ultimately, BPA installed electrical equipment in substations around Seattle and Portland to strengthen the entire electrical system. It also added a substation east of the Cascades, thus wringing more capacity from the transmission system.

The National Energy Policy Act of 1992 and the open transmission access rules issued by the Federal Energy Regulatory Commission brought to the Northwest increased competition for wholesale electricity markets and a significant increase in demand on the federal transmission system. For TBL, the clash between significant increases in customer demand and customer desires to keep costs down brought pressure from two directions. On the one hand, TBL saw new and sometimes startling changes in the use of the transmission system. On the other hand, it had to cut costs.

With 80 percent of Northwest high voltage transmission capacity and over 15,000 miles of line

TBL will take written comments on "Reliability and the Future of Transmission Costs" from Nov. 15 to Dec. 20, 1999. Send comments to: P.O. Box 12999, Portland, OR 97212 or e-mail to comments@BPA.gov. For questions on sending your comments, call: (503) 230-3478 (Portland) or 800-622-4519.



covering 300,000 square miles, BPA saw the need to focus more clearly on giving the public and customers what they want at the right price. Rather than continue to develop and expand the system, BPA stepped up its use of innovative technologies and techniques for planning its transmission system. Finding the least cost, least impact alternative to solve reliability or load service problems is part of TBL's mission.

That has had a profound effect on expenditures. The number of line miles and substations has remained virtually the same since 1993. Borrowing for capital – that is large, long-lasting projects — declined 66 percent from \$361 million in 1992 to \$123 million in 1998, and borrowing for main grid projects dropped even more, by 84 percent.

WHY TBL CAPITAL COSTS ARE GOING UP

It was much easier to plan and operate the transmission system before competition. The Northwest transmission system was characterized by a stable market with long-term firm contracts, few but large generating resources, predictable bulk power transactions and limited competition. There was a significant margin in the system and the Columbia River hydro-power system could easily be dispatched to provide reliable transmission.

Today, the system is affected by the large number of complex transactions, some of which involve smaller and more volatile generation, and by the way the Columbia River is operated. For example, it is more difficult to dispatch federal hydroelectric dams to bolster the system when they're needed because of constraints on the power system for salmon recovery activities. In addition, open access does not contemplate the uncompensated dispatch of resources for this purpose.

Consequently, there are a number of issues that will drive capital costs higher than they have been during fiscal 1997-01. Those include a growth in demand for power west of the Cascade Mountains, reactive needs, reinforcements for new generation, constrained paths or areas of congestion, more stringent reliability criteria, system replacements and the

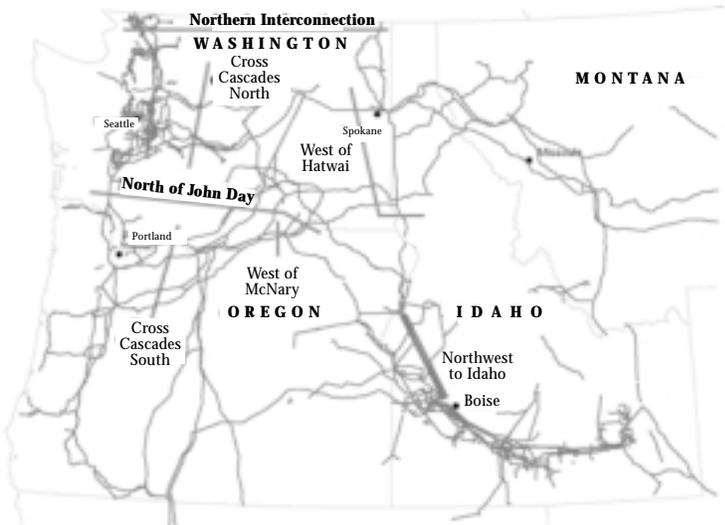
continued improvements to TBL's communications through fiber optic installations.

Reinforcement for new generation

Generation developers pay for all costs to interconnect with the grid. New generation also puts requirements on the transmission system to move the power from these generators out of the area. There are areas where the transmission system no longer has the margin of capacity to handle the additional power. New generators expected in the next years include Klamath Falls, Hermiston, Coyote Springs #2, Sumas #2, Everett Delta and Rathdrum #2.

Meeting load growth

Two-thirds of growth in the Northwest is occurring in urban areas west of the Cascade Mountains, such as Puget Sound.



Constrained or congested paths

Congested areas include routes across the Cascade Mountains, West of Hatwai, Northern Interconnection, Pacific Northwest to Idaho and West of McNary.

Reliability criteria

The push for more stringent adherence to reliability criteria is due to a heightened awareness of reliability issues. Some criteria have tightened, such as the prohibition on scheduling more power over a pathway than its operating transfer capability. And some criteria of the Western Systems Coordinating Council are becoming mandatory and BPA will be

subject to monetary sanctions for non-compliance. Multiple contingencies are now driving project needs and operation of the system, which is driving costs up.

Fiber optic installations

TBL expects to continue to expand fiber optic infrastructure for the communications that operate the system. To date, BPA has installed 2,000 miles of cable on existing rights-of-way at a cost of \$127 million. BPA has been installing fiber optic cable to control and monitor its transmission grid and keep it reliable since 1984. The fiber cable replaces a microwave communication system that is becoming outdated. Fiber also helps BPA keep up with the growing amount of data being sent across the system.

Standard fiber cable is larger than what is currently needed to operate the grid, although TBL expects to eventually use 100 percent of the capacity. But in the meantime, it can lease excess in order to cover part of the capital costs of the program. Since BPA's transmission lines run through rural areas, it also can make broad band telecommunications available to small communities in the Northwest not served by commercial providers because the cost of service is too high.

HOW MUCH ARE COSTS RISING AND WHY?

In previous meetings, TBL has warned customers that changes may increase transmission rates for fiscal 2002-3 by as much as 20-40 percent. TBL is now the third lowest-cost transmission provider in the Northwest. Even with the increase, it will still be the third lowest and lower than most others in the region.

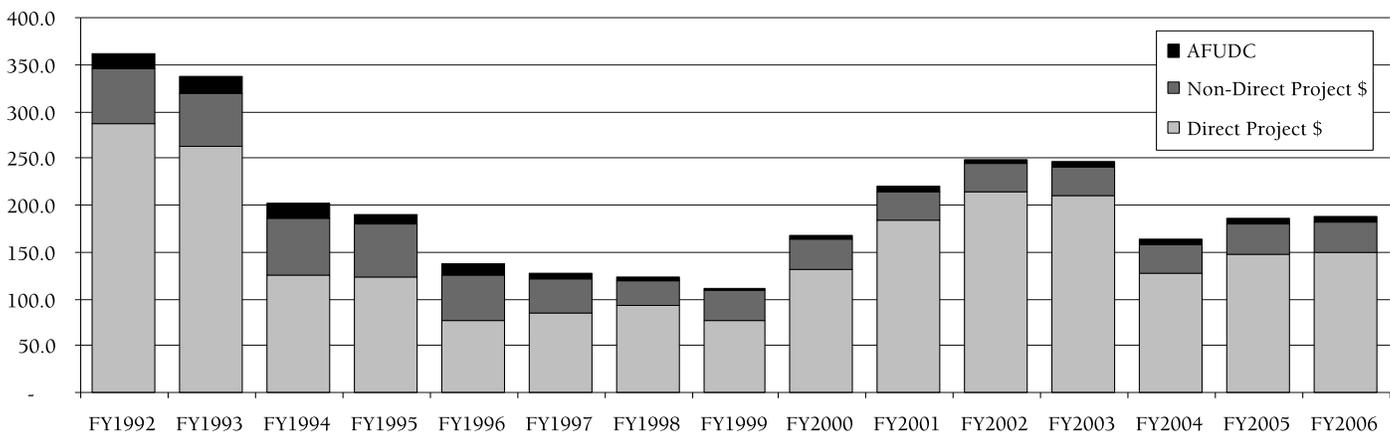
Projects that are driving increases in TBL's capital budget address the problems of growth, reinforcement for new generation and congestion. The proposed projects are based on current information of forecasted levels of demand and generation. Significant projects include:

- East Seattle reinforcement and North Seattle transformers will improve reliability in Puget Sound, as well as transfers into Canada. Costs in the 2002-3 rate period are projected at \$2.9 million.
- Series capacitors at Schultz Substation will improve reliability across the Cascade Mountains and in Puget Sound, as well as transfers into Canada. Costs in the 2002-3 rate period are projected at \$27.9 million.
- McNary-Slatt 500 kV line will accommodate new generation from Boardman and Hermiston

Capital History

FY1992 - FY2006

(\$ in millions)



FY92 through FY99 Actual Capital Expenditures
 FY99 Unaudited
 FY2000 and FY2006 Based on OMB 2001 Budget Submittal

areas, both in Oregon. Costs in the 2002-3 rate period are projected at \$0.9 million and in the 2004-6 period at \$2.4 million.

- West of Hatwai fixes will improve transfers from Montana. Costs in the 2002-3 rate period are projected at \$52.7 million.
- Northern Intertie fixes will improve transfers to and from Canada. Costs for the Monroe-Echo Lake 500 kV line in the 2002-3 rate period are projected at \$37.7 million.
- Southwest Oregon coast reinforcement project costs in the 2002-3 rate period are projected at \$26.8 million and in the 2004-6 period at \$6.8 million.
- Replacement costs for transmission, substation and communications equipment, non-electric plant, tools and emergency replacements in the 2002-3 rate period are projected at about \$108 million and in the 2004-6 period at \$176 million.
- Fiber optic construction costs to improve TBL communications systems and operational reliability in the 2002-3 rate period are projected at \$42.5 million and in the 2004-6 period at \$24.9 million.

As comprehensive as the list of improvements is, there are still projects that TBL has not included in the current plan.

- Transmission facilities to support breaching, if ordered, of the four lower Snake River dams.
- North of John Day support (California-Oregon Intertie and Pacific Direct Current Intertie improvement for increased spill).
- DC Intertie (mercury arc valves) replacement.
- I-5 corridor support (500 kV line for new Westside generation additions).
- Right of way renewals on tribal lands.

NEW ISSUES

TBL is considering several issues that affect planning, the level of capital spending and fairness.

Contract obligations vs. load forecast —

When planning transmission system growth in the past, BPA relied on forecasts of growth in power needs. Today, in an effort to cut costs, some energy suppliers or purchasers are not buying firm transmission service to cover full peak load requirements, but instead are relying on short-term transmission service to cover peak load needs. The revenues from this short-term service are uncertain and are not sufficient to reinforce the system to meet the corresponding peak load. If the system is not reinforced and transmission shortages occur, all interconnected parties would be affected, including those that purchased long-term firm transmission service.

Some mechanism is needed to balance reliability with commitments customers are willing to make. Customers could continue to sign up for the reduced levels of transmission service, but in exchange they may need to offer TBL some protection if the system is in trouble. This could mean giving TBL the ability to trip specific loads to relieve constraints or for the reliable operation of the system. This is also an equity issue for those who already pay for annual long-term firm service. TBL is working with the Northwest Regional Transmission Association on this issue but would also like your comments.

Transmission reactive charge —

A portion of BPA's capital budget is used to install shunt capacitors on the system. These capacitors supply reactive power required by the transmission system. In some cases shunt capacitors are used to supply reactive power to customer loads and transmission systems.

It is generally less expensive to install capacitors at load sites than on the main grid transmission system. TBL would prefer to have customers manage the reactive requirements caused by their loads by installing required capacitors at their loads. This would result in lower costs to all customers of network transmission services.

To encourage customers to install necessary capacitors at load sites rather than relying on the transmission system reactive capacity, BPA has a reactive penalty charge. However, some customers still depend on the main grid system to supply reactive power needs for their loads. BPA is looking for suggestions of how to reduce the reliance on the network to serve reactive needs at customer loads.

Locational pricing signals —

Regional transmission organizations use pricing approaches to encourage generation and demand-side management to be located in a manner that uses transmission efficiently. If generation and DSM could be placed in very specific areas, such as in western Puget Sound, it could delay such expensive projects as a new transmission line across the Cascade Mountains. This concept was introduced in the original Puget Sound Area Reliability Study.

TBL has looked at a number of locations to see what effects siting and operating new generation would have on the transmission system. However, TBL is not ready to recommend pricing signals for two reasons. First, for the generation to be of value, it must be

connected to specific locations on the transmission system and on-line in finite amounts. Also, for every positive effect of building locational generation there are also unknown or negative effects. In western Puget Sound, for example, the obvious positive effects for winter loads are offset by the difficulty of moving the new power out of the area in the summer.

However, because of the interconnected nature of the grid, parties have suggested that it is more appropriate for a regional transmission organization to apply this approach than BPA alone.

RTO formation —

The proposed capital and expense spending reflects BPA's continuing effort to plan, reinforce and operate the transmission system as it has in the past. However, FERC is encouraging formation of regional transmission organizations. It is TBL's intent to participate in these regional discussions and, if possible, join the RTO. If TBL were to join an RTO, it may no longer be responsible for the expenditures that are discussed above. But since the RTO formation may be several years away, TBL is continuing to ensure that the Bonneville system is safe and reliable.

Bonneville Power Administration

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DOE/BP-3222 November 1999 2M

