ACCESS

TBL MARKETING BI-MONTHLY

Issue No. 2 **May 1999**

Utilities, BPA debate virtues of open access

Even when systems are in place to make sure all have the nondiscriminatory open access to transmission an open market demands, there are times when what is fair for all may not be what one customer wants.

"We have made many changes to ensure overall nondiscriminatory open access to our system, and we're continuing to make the changes that will improve our service to customers," said Chuck Meyer, TBL vice president of marketing and sales. "However, we're discovering that our systems, such as OASIS and open access tariffs, currently don't cover all the day-to-day issues that arise."

OASIS is a nationally standardized computerized approach for customers to reserve space on transmission systems.

> MOST CUSTOMERS ARE TELLING US THEY ARE TRULY BETTER OFF IF WE TREAT EVERYONE EQUALLY.

It gives access to price and capacity information for everyone at the same time, ensuring fair and equal open access.

The TBL and its systems already meet a high standard for nondiscriminatory open access, but the electric industry is evolving and so are the standards by which the system operates. The challenge, Meyer said, is to continue to meet that ever-growing standard.

He cited one recent example in which a customer claimed it had made a mistake when providing information for reserving transmission on OASIS. This resulted in a contract that did not meet the customer's needs. Fairness to all other customers dictates the customer should live with its request or surrender the contract and then lose its place in line for available capacity. However, good customer service for this customer, like that practiced at Nordstrom, says we should make sure the customer gets what they want, Meyer said.

While correcting a "mistake" may seem like a small issue to many customers, it is a very large issue if it results in discriminatory access.

continued on page 2

Kennewick-area customers meet with Chuck Meyer, vice-president of sales and marketing, to discuss issues. Transco, rates and open access were among the most-asked questions. The meeting was one of nine held to date around the Northwest.

In This Issue

page

- *Utilities, BPA debate virtues of open access.....1*
- *Crews team up to repair Burley line 2*
- *TBL intertie maintenance schedules involve customers 3*
- *Distributed generation poses challenges 4*
- *"Tell TBL"–Letters to the Editor ..5*
- *Technology increases transmission capacity, cuts costs 5*
- *Fixing the Millennium Bug.....7*

Open Access — continued from page 1

This kind of issue will look different to each customer depending on how it affects them.

"We are having to be exceedingly careful and diligent in our day-to-day operations and with customer requests to maintain the fairness required when operating a transmission system that provides an open market," said Meyer. "It's a balancing act for us, one in which we need to continually raise the bar for customer service and still provide nondiscriminatory access."

There are also times when a customer wants to work with the TBL to tailor a contract that fits a special need and working with that customer constitutes good customer service. But what's offered to one customer, Meyer said, may have to be offered on OASIS at the same time to all other customers.

"This signals a change in the way an open market operates," Meyer said. "Most customers are telling us they are truly better off if we treat everyone equally, even if we can't always take care of each customer's immediate request in the way they would like."

How TBL manages special needs is also important because some customers still believe there is an inappropriate business relationship between BPA transmission and power that would cause TBL to favor the Power Business Line over other customers and marketers. That's not true, Meyer said. TBL treats PBL as it would any other customer.

TBL and PBL separated most of their business functions in 1997. TBL headquarters relocated to Vancouver, Wash., while PBL employees moved to Portland, Ore. in 1998. At the same time, computer systems were split and no PBL employee has favored access to TBL information or work areas. These changes aim to stay true to Federal Energy Regulatory Commission orders 888 and 889 that were designed to cause fair access to the transmission system while fostering a competitive wholesale marketplace.

Meyer said the TBL strives for a transparency of operations and an independence from market functions. In fact, its voluntary functional separation from PBL was to assure customers fair and equal access to its system. When doing so, he said, it also assured the PBL a place in the market because, under today's rules, any agency or company who wants to use other systems' open access transmission services must also provide equal access to its transmission system.

Since that time, the U.S. Department of Energy, BPA's parent agency, has directed that BPA and other power and transmission operators under its governance must separate functions. In addition, President Clinton's recent electric industry restructuring bill would bring BPA under the Federal Power Act and shift the authority for determining transmission rates, terms and conditions from the BPA Administrator to FERC.

Meyer believes this is good policy.

"Operating under the FPA and FERC jurisdiction would alleviate worries that some customers have about the ability of BPA to provide nondiscriminatory open access to its transmission system," Meyer concluded. "However, we still will have to be exceedingly careful with customer requests. We all will be better off if the TBL cares about the quality of its service, continues to raise that quality and does it in a way that everyone benefits."

Crews team up to repair Burley line

The morning of Feb. 17, 1999 brought a cold wind from the southwest. It swept across road 100W west of Burley and a wood pole 138-kilovolt line.

Although the line was built to withstand 70 mile per hour winds, Feb. 17, the wind gusts were as high as 80. The line was parallel to the road, but perpendicular to the wind. And most poles had stacks of insulators on top. The poles began to sway.

It took close cooperation to clear the road and restore this line near Burley, Idaho.

By 9:30 a.m., some poles couldn't take anymore. Along one mile they snapped, at ground level, two feet up, some at waist height. Conductor, poles and insulators crashed across the asphalt, closing the road.

"It's lucky there weren't any cars," said Lynn Kerzman, BPA regional manager, "and the line fell away from the houses to an empty field." Still, the poles broke an irrigation pipe and damaged a United Electric 12.5-kV underbuild line below. After the distribution feeders were switched to route around the section that was down, United crews, a crew recuited from Raft River Electric Co-op and BPA crews cleared debris off of the road and built a temporary line to restore power to the last five houses. By 2 p.m. the road was cleared. By 9:30 p.m. power was restored to all.

United's line crew reached the scene almost immediately. BPA dispatch called out its Idaho Falls line crew, but it was 175 miles away, on its way to West Yellowstone.

"During the emergency and rebuild of the line all the continued on page 3

TBL intertie maintenance schedules involve customers

Nine months ago, customers had only three days notice for a planned outage. Today, they have 45 days and they can have a say in the outage planning process.

"We needed to begin looking at outage maintenance scheduling from a business standpoint," said Jim Vinson, manager of TBL's substation operations. "To maximize intertie capacity, we had to look at how to arrange outages with greater predictability."

The result is long-term planning that avoids some of the uncertainty of previous short-term outage planning while getting the most from the intertie system for more and more customers. The process, which was developed with the Northwest Power Pool, better involves customers in the outage planning process.

In the past, outages were based upon line crew availability and weather, not necessarily on how the intertie was used by customers. The old process did not provide the longer term intertie capacity predictability required in today's deregulated utility industry.

> "Customers were telling us they wanted the consistency that long-term planning for outages would provide."

"We had a number of situations where planned outages were being postponed or canceled," Vinson said. "Customers were telling us they wanted the consistency that long-term planning for outages would provide."

As the electric utility industry has deregulated, particularly in wholesale power transactions, the TBL has become much more aware that it is in the business of supplying a path for marketers to deliver power.

"To be effective in the industry, transmission maintenance should be invisible to customers," Vinson said. "In other words, we should not do anything to interrupt the business of moving power."

However, the TBL still needs to maintain a highly reliable system. That balance is maintained through the new process.

Once the province only of transmission operations, scheduling outages is now a multifaceted process that involves operations, intertie owners, TBL's business partners and its customers.

It begins with a long-term look at the needs for system maintenance, then at what capacities the system has sold on the interties and what it expects to sell over the given 30-day period.

The 45-day process looks like this:

After checking for obvious conflicts — about 44 days prior to the outage month — a proposed outage schedule, along with a conservative estimate of transfer capacities, is placed on OASIS for public comment. That comment period closes four days later.

After comments, an outage plan is drafted taking into account conflicts, the least impact on transfer capacities, comments from customers, long-term contracts and transmission reservations. Owners of the interties approve the plan and about 34 days prior to the outage month, the plan is again posted on OASIS and opened to public comment. Comments are sent to BPA via e-mail at bpaoutage@bpa.gov.

About 30 days prior to the outage month, the approved plan with estimated path capacities is posted on OASIS. Two weeks prior to the outage week, the final limits on studied intertie transfer capacities are posted.

Although this process has improved consistency in scheduling maintenance outages, Vinson said emergency and urgent maintenance, weather, changes in loading and generation, can suddenly alter intertie capacity. Maintenance outages on transmission systems outside the TBL can also affect Northwest customers. This was the case in April when Los Angeles, a system that continues to practice three-day maintenance scheduling, reduced the capacity on a portion of the southern intertie with only 72 hours notice.

"This is a dynamic system that's always changing and we're trying to impose a plan on it," Vinson said. "The trick for the outage dispatch office and the system dispatchers is to manage the schedule with real time stresses on the transmission systems."

Burley Line — continued from page 2

crews worked very well together," United engineer Dick Hagemann said. "Some BPA crew members were there shortly after the event. We all got in there and got the job done."

"It was a mess," Kerzman said. A mess that will cost BPA up to $300,000 to repair damage, replace its line and repay United for its expenses.

Engineers, including Kirk Robinson, redesigned the line using current criteria and ideas from the line crews and United. Poles now carry more of their insulators on the windward side and lean into the wind, so they can withstand winds of 100 mph. They are on average 250 feet apart compared to 400 feet before.

"We had decided to fix the line," Kerzman said, "but the wind got to it before our work order."

"BPA crews stayed on it until both lines were repaired and power was transferred back to our line," Hagemann said.

The new line already had its first test during an April 9 blizzard.

"It held up real well. The new line looks a lot better," Hagemann said.

Distributed generation technologies pose challenges for transmission system

Within five years, distributed generation technologies will provide power for at or below 5 cents per kilowatt-hour, and in 20 to 30 years, it will make up half of the generating resources in the United States.

These are two of the predictions made at a recent symposium on electric technologies that could change the way the entire electric system operates.

BY 2020 TO 2030, FUEL CELLS WILL BE MORE THAN 50 PERCENT OF THE MARKET.

The "Electric Revolution" conference in Portland, March 18 and 19, set the stage for a future with small, local and environmentally-friendly power generators. The advent of this new technology is predicted to change the role of central station generation and, with it, the way the Northwest power grid fits into the future energy picture.

"This has the potential to further the values of the Pacific Northwest," said Judi Johansen, BPA administrator as she closed the conference. "These technologies work. And they're coming to market sooner than we think."

Distributed generation resources can foster self-sufficiency, customer choice and environmental friendliness, Johansen predicted. Distributed generation resources can be any type of small power source using a variety of technologies and fuels and coming in nearly any size. They include small micro-turbines fueled by natural gas, fuel cells, solar, wind, geothermal and dispatchable energy efficient technologies. Or, they could be hybrids that put together the most beneficial of any of these technologies.

They also have the potential to change the way transmission and distribution operates, how efficient they will be in the future and how they are configured to integrate distributed resources.

Mike Hoffman, international market lead with BPA's Energy Efficiency department, believes distributed generation will turn the energy grid into a two-way web that has the potential to disrupt business unless the grid itself changes to accommodate these new technologies.

"Distributed generation could create chaos on the transmission system through the shear numbers of transactions and interconnections caused by small generators that go on and off line," Hoffman said. "But if its coordinated in a market-based system, that could reduce costs and increase reliability to all parts of the electric system, creating the new 'energy web.'"

Some symposium speakers suggested that these small, local power sources installed at substations or on the customer's side of the meter could reduce transmission congestion, support voltage, shave peaks and improve the use of distribution assets.

"ARE WE IN A BUSINESS TO SIMPLY MOVE ELECTRONS FROM ONE PLACE TO ANOTHER, OR ARE WE A TRANSPORTATION COMPANY WITH VALUE-ADDED SERVICES?"

Dave Jermain, president of the Jermain Company, was one of the speakers who said that distributed generating resources will have a large effect on transmission systems, especially if those systems see themselves as agents for encouraging changes in technology. Jermain has spent the last ten years working with electric utility companies as a strategist and project manager.

He said years 2010 to 2020 will see a shaving back of the high voltage transmission system as central power generating stations take on more of a "storage battery" role and are no longer the sole source of power for businesses and homes. By 2020 to 2030, he said fuel cells will be more than 50 percent of the market.

"If you assume the ability to expand the existing transmission system is limited due to such factors as environmental constraints and you also assume continuing growth in demand for power, congestion will be an increasingly important concern," Jermain said. "Under these assumptions, there will be an increasing movement toward more localized generation."

Creating mini-grids locally will help resolve future congestion problems.

There are three areas Jermain believes transmission and distribution could benefit from distributed generation. It could:

- Improve reliability;
- Serve areas where rapid growth is outpacing the ability of the system to deliver energy;
- Replace expensive line extensions.

"Transmission systems need to play a role other than just encouraging this technology publicly," Jermain said. "They need to look at this as part of their business plan and as a set of transactions."

He suggests electric utilities should ask themselves this central question: "Are we in a business to simply move electrons from one place to another, or are we a transportation company with value-added services?"

"If the latter is the case, then this technology is another tool in the equation of doing the business they intend to do," Jermain concluded.

Technology increases transmission capacity, cuts costs

Better use of technology is transmitting more electricity for more customers than ever before without building new lines that would increase costs, prices and environmental impacts.

A recent study of BPA's capital spending revealed dramatic changes. Borrowing for large capital projects dropped 66 percent, from $361 million in 1992 to $123 million in 1998. Borrowing for main grid projects dropped even more, by 84 percent. Maintenance costs dropped by $22 million, from $80 million in 1992 to $58 million in 1998. The number of transmission line miles has remained static since 1993, as has the number of substations. But spending for communications and computer controls has remained steady.

Alan Courts, vice president for engineering and technical services, led the study. He says, two events that occurred over the past decade caused BPA and its customers to look differently at how to develop transmission capacity. The first was a 1989 cold snap in Puget Sound and the second was the National Energy Policy Act of 1992.

The cold snap pushed electricity demand to double the year around average and the unprecedented growth in the 1980s and 1990s, also in Puget Sound, pushed electrical demand higher each year by as much as 300 megawatts. The region was in danger of brownouts, or lowered voltage, and even blackouts due to the loss of an entire transmission line.

The traditional solutions were to build more power plants on the west edge of the Cascade Mountains or to build another transmission line over the Cascades, giving the transmission system more capacity to carry power produced on the east side the mountains into the growing areas west of the Cascade Mountains.

With the public's concerns in mind, BPA and its Puget Sound customers found an environmentally "greener" solution to the traditional utility response — use technology to make the most of the existing transmission system.

Public pressure said that too much land through the Cascades was already being used for transmission lines and siting new generation, whether thermal or hydroelectric, was a difficult endeavor in an era of heightened awareness for the environment.

With the public's concerns in mind, BPA and its Puget Sound customers found an environmentally "greener" solution to the traditional utility response — use technology to make the most of the existing transmission system.

"You can wring more capacity out of existing power lines," said Courts. "And, if you're worried about losing a whole line, why not split them in half? Then you have less to worry about."

The solution was threefold: install new equipment at several Seattle and Portland-area substations that increase line capacity; build a new substation halfway across the Cascade Mountains; and step up utility efforts to conserve consumer electricity use. It worked.

"The solution not only saved Seattle electricity users from blackout, it also saved customers as much as $230 million in electricity costs," Courts said. "It not only costs us less money, it's also good for the environment."

continued on page 6

Tell TBL ◆ *Letters to the Editor*

To Gary Parks

On January 18, 1999 Klickitat PUD experienced an outage at our Gilmer Substation north of White Salmon. Our initial investigation gave us reason to suspect a problem with the station transformer. I contacted the Munro Control Center in Spokane to ask for assistance from BPA to test our substation transformer. I also contacted Jeff Hathhorn in The Dalles at his home with the same request.

The Dalles District Maintenance crew responded promptly with a crew to test our substation transformer. Your crew did a very professional and thorough job of testing. Fortunately, the transformer tested good and by eliminating the transformer as the potential problem, we were then able to find the cause of the outage.

I want to express my appreciation to Bonneville for your quick response to our request for help. It is also very comforting to know that Bonneville has the resources to provide assistance in times of emergency. Thanks again.

– *Robert H. Havig,*
Operations Manager
Public Utility District No. 1
of Klickitat County

ACCESS *is produced bi-monthly for the Bonneville Power Administration Transmission Business Line.*

*Send your letters and comments to your account executive or to "***Access:** *Letters to the Editor," Bonneville Power Administration, Transmission Business Line – T-Ditt2, P.O. Box 491, Vancouver WA 98666; e-mail: skblair@bpa.gov*

Technology — continued from page 5

The National Energy Policy Act set the stage for the most fundamental restructuring the U.S. electric power industry had seen in six decades. It brought deregulation, competition for the wholesale electricity markets and a drive to reduce electricity costs.

Survival meant changing transmission philosophy. With 80 percent of the Northwest transmission, BPA saw that it needed to focus on giving customers what they want at the right price. Rather than continue to expand the transmission system, it began to use innovative technologies and techniques to operate and maintain the system at a lower cost.

BPA met immediate needs by installing static var compensators and series and shunt capacitor banks. Compensators regulate voltage, while the capacitor banks maintain and boost voltage to squeeze more capacity out of the system. As a result, the performance of BPA's transmission system has more than doubled over the past decade.

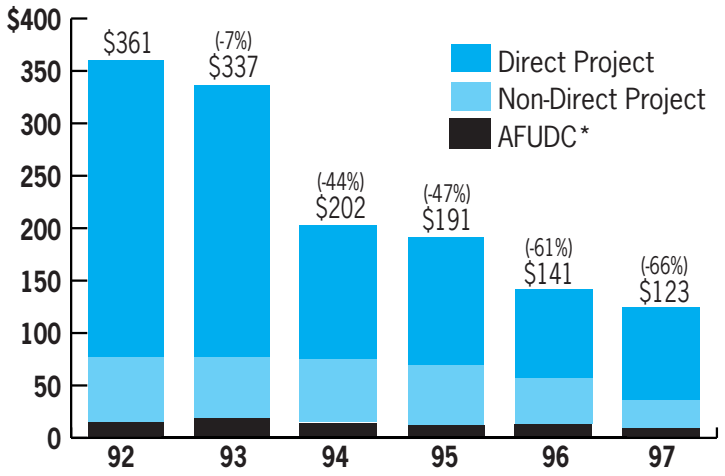
An example of how technology can increase capacity is the direct current intertie that links the Northwest with California. When completed in 1970, the line carried 1,400 megawatts. After the addition of state-of-the-art equipment added at the terminals, the line can now carry 3,100 megawatts.

Fiber optic communications and upgrades to its computer system enables the transmission system to be managed more efficiently. BPA installed its first fiber optic cable in 1992 and today has over 1,800 miles of fiber optic lines. It upgraded its SCADA — supervisory control and data acquisition — transmission computer system and it installed remedial action schemes to monitor and correct outages. These automatic controls react within twenty one-thousands of a second to keep the system stable after a disturbance.

BPA also began to maintain its system based on the need for repairs and how critical the equipment is to maintain reliability, not on the preset schedule it had operated on for decades.

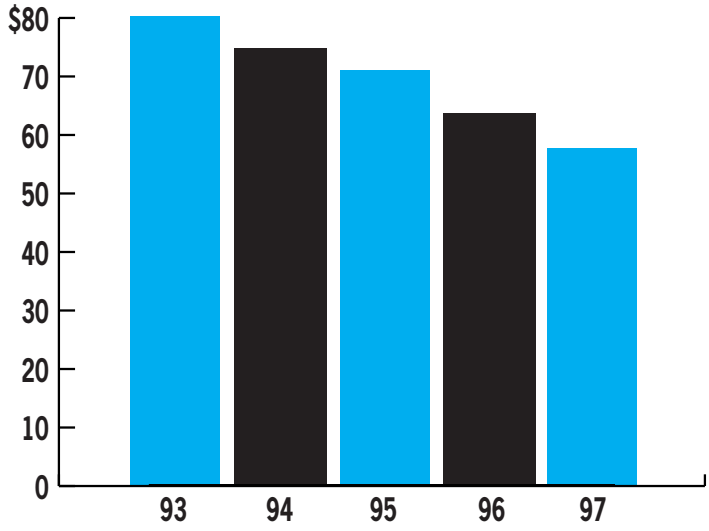
Rethinking where to spend time, effort and money has improved reliability. Utilities have installed more monitors and control equipment to detect and respond to outages. BPA has been operating its high-voltage lines more conservatively. Communications between utilities have improved. A new $4 million computer system to track schedules and show who is using the system should be installed by January.

Capital projects historical trend ($ in millions)



*Allowance for funds used during construction. Interest on materials for work in progress.

System maintenance direct expense history ($ in millions)



Fixing the millennium bug

New Year's eve came early to Keeler substation in Hillsboro, Ore. BPA turned its clocks ahead with a live test of its supervisory control and data acquisition — or SCADA — system. With the test, the latest of many, BPA demonstrated that one of its mission-critical computer and automated operating systems is ready to perform in the year 2000.

The agency set its clocks ahead from 11 a.m., April 2, to 11 p.m. Dec. 31, 1999, and counted ahead minute by minute to the turn of the millennium. Nothing happened — which was the desired outcome of the test — except for the cheers from the crowd of BPA officials and journalists gathered at the substation.

TBL ACCOUNT EXECUTIVES AND OTHERS BEGAN WORKING WITH CUSTOMERS IN APRIL TO PUT TOGETHER INDIVIDUAL CUSTOMER CONTINGENCY PLANS.

Then, at 12:05 a.m., Jan. 1, 2000 (12:05 p.m., April 2, real time), Brian Fackler, substation operator at Keeler, ordered the circuit breakers closed on an outgoing 500 kilovolt line, ending the test with a loud zaaaap and the sweet sound of success for the Y2K warriors.

"I'm proud to announce today that all of our inventory and equipment is Y2K ready," said Joe O'Rourke, chief information officer for BPA. "We've done what we said we'd do, but we won't stop here today. Our program for Y2K readiness will continue to run through March 2000."

Even though he expects BPA's transmission system to operate reliably and safely on the two key Y2K dates (Jan. 1, 2000 and Feb. 29, 2000, or leap date), he said the agency would continue through the rest of 1999 to prepare BPA and its customers for the changeover in computer clocks.

TBL account executives and others began working with customers in April to put together individual customer contingency plans. Those plans will look at the interfaces between BPA and its customers, assess all the possible things that could go wrong, plan for them and staff the most crucial sites.

Y2K is a computer hardware and software problem that prevents computers from accurately calculating dates beyond 1999 because they were programmed with a two-digit date field in which any year ending in "00" would be interpreted to mean 1900, not 2000.

About 120 people on BPA's Y2K team began preparing for Y2K by inventorying BPA's automated systems and replacing, upgrading or discontinuing systems with Y2K problems.

Every automated system that is critical to the operations of BPA's transmission system was tested. Of the more than 19,000 pieces of equipment involved in the operation of BPA's transmission system, nearly 2,400 use computers, software or embedded chips.

Closing a breaker signals the end of a successful Y2K test of the Northwest's federal grid.

SCADA is the equipment that communicates with and controls transmission operations at 187 of BPA's 363 substations. The Munro SCADA was updated in 1996 and at Dittmer in early 1998.

BPA will maintain the readiness it has already achieved through "clean management," a regimen of ensuring all new computers and software brought into the BPA system are Y2K compatible before they are installed. However, BPA will spend most of its time through the remainder of 1999

continued on page 8

Millennium — continued from page 7

planning and staffing for unforeseen problems.

"The contingency plan is a safety net," said Brian Furumasu, TBL Y2K manager. "Our objectives are to have enough staff on hand for potential problems, to operate the system very conservatively and to have in place back-up communications with our customers and business partners," said Furumasu.

Also, as 1999 clicks over to 2000, BPA will turn to a more conservative operating strategy to cut down on the possibility for error. BPA plans to operate the transmission system with more generation resources, reducing the intertie loadings to keep the stress on the system low, look closely at the operations of large loads, initiate operating strategies that reduce the system's dependence on automation and plan to operate with minimum communications.

Y2K experts identified communications as one of the possible weak links, but Furumasu said communications is another area where BPA has a high level of confidence due to its extensive microwave system that links all BPA facilities as well as other utility microwave systems. The microwave system is analog, not digital, so is not subject to potential Y2K failures.

BPA will have extra staff and equipment on hand New Year's Eve.

"We don't have to rely on another communications system that may have its own Y2K problems to ensure good communications with our facilities and customers," Furumasu said. "On the other hand, we don't want to leave anything to chance, so to achieve perfect system confidence, we're purchasing satellite cell phones for back-up communications." The satellites are already Y2K ready.

"The contingency plan also has provisions for operating the power system manually," said Terry Doern, electronic engineer in operations. "In the unlikely event there is a failure someplace in the system, we will be completely prepared to operate any part or all of the system manually."

More information on BPA's Year 2000 Readiness Program is available from TBL account executives or on the web at www.bpa.gov.

Bonneville Power Administration

P.O. Box 3621 Portland, Oregon 97208-3621

DOE/BP-3150 May 1999 1M