

## Powerline Telco completes NRECA BPL trial

### Latency didn't foul rural VOIP/gaming

### Maryland co-op not sold on BPL yet

Whether BPL can effectively deliver high-speed internet was always "an article of faith," noted Powerline Telco's Subodh Nayar.

His firm was picked by NRECA's Cooperative Research Network (CRN) to run BPL trials at two rural co-ops -- West Florida Electric Cooperative in Graceville, Fla and the Southern Maryland Electric Cooperative (SMECO, rhymes with "gecko") (*BPL Today*, 3/21, page 4).

NRECA wanted to see whether BPL is up to the challenges in rural deployments.

The trials ended recently and proved BPL does work, Nayar told us last week.

His firm's findings were reported to CRN but that group's final report isn't out yet (<http://crn.cooperative.com>).

"We found that [BPL] worked reliably and delivered a performance that was comparable to DSL," Nayar reported, in high speed and low packet loss, latency and "jitter" -- a kind of distortion sometimes experienced with voice and video transmissions.

"We concluded that it was easy to install and operate," and "has a role to play" in delivering connectivity to rural areas, he explained.

Nayar was speaking for Powerline Telco, he noted, and will let CRN give its own analysis of the findings.

Powerline Telco's experience leads the firm to count BPL among a variety of networking technologies that fit into a hybrid approach to networking for co-ops including wireless, satellite, DSL and cable.

BPL's main advantage over DSL is that its injection point -- where the internet signal is inserted into the network -- can go anywhere.

DSL's "point of origin" is at a "central office."

BPL's basic infrastructure, the power wires, are pre-installed -- another advantage.

BPL works best when the signal's not repeated, noted Nayar.

Using a single repeater requires the bandwidth to be cut in half, explained Current Technologies -- one of the two vendors in the trials.

That splits the available frequencies into two separate regions -- one for each BPL box.

Add a third repeater and any number of subsequent repeaters and the available bandwidth at each box is cut to one-third, said Current.

Ascom gear was used at West Florida and Current's gear at SMECO.

Repeating the BPL signal didn't seem to create significant latency, said Nayar -- a delay in signal transmission that can degrade voice and video services.

The total latency experienced never interfered with reliable VOIP service or graphics-intensive online video gaming, he reported -- two of the services the firm set out to test.

Web surfing -- not sensitive to latency -- was tested, too.

"Those are really the three sources of revenue" from rural broadband deployments, noted Nayar.

The test proved BPL could successfully and reliably deliver VOIP and gaming service, he stressed.

The projects didn't include video on demand, for example, or any mention of utility applications.

The main driver for BPL at co-ops is the demand for broadband service to the underserved.

Packet loss was negligible, Nayar reported.

The trial included simulating three kinds of broadband users:

- The light user who surfs the web and sends some photos;
- The medium user who uploads and downloads music files, uses residential VOIP service, plays an MMOG (massively multi-player online game), and
- A heavy residential or small business user with lots of uploads and downloads of large files and multiple concurrent VOIP calls.

Nayar believes larger firms are more likely to use copper T1 or T3 connections or optical fiber.

Powerline Telco had an existing relationship with SMECO before the CRN trial was crafted.

The firm was hired by SMECO in

2004 to put together a plan to bring broadband to the firm's entire footprint, said Nayar.

Potential customers tend to be fairly tightly clustered around SMECO's substations sweetening the case for bringing fiber or fixed wireless to those points.

Nayar likes a fixed wireless/BPL hybrid for rural co-ops -- since utilities can put up small radio towers on the substation property they have.

Those networks are relatively inexpensive, he added.

Such towers might distribute service into the field -- or act as backhaul for BPL.

"The best use of BPL" is to cut the cost in distributing such signals, said Nayar.

SMECO's got a small footprint, he added, and he believes the utility is seriously committed to bringing broadband to its customers, many of whom already have at least one broadband source available such as DSL.

As for broadband -- Nayar cautioned us about the term.

He prefers the term "high-speed internet" since for some underserved users such as those in rural areas -- any relatively fast internet will seem high-speed.

Service providers that can get a connection to users that's not up to even the FCC's outdated broadband definition of 256 kbps may find eager acceptance of the service just the same.

### SMECO not ready

The Hughesville, MD-based co-op is watching BPL but not moving ahead with it, the firm's Contract Administrator Tom Tudor told us last week.

A variety of factors chilled the utility to BPL for now.

One dilemma is crowding on the overhead lines.

Strict requirements that come attached to the Agriculture Department's Rural Utility Service loans for infrastructure keep wasted space on utility poles to a minimum.

That leaves very little room to add BPL boxes, he explained, especially where poles carry telecom and cable

wires.

Safety for line workers is an issue in that cramped space, he warned.

The BPL gear used for the trial needed to be attached to a transformer to pass the signal to the LV side, Tudor noted, and sometimes the utility pole with the transformer didn't have room for a BPL box.

Line workers would put the BPL box on a nearby pole -- maybe two or three poles away -- and run a new line back to the transformer, said Tudor.

A BPL business plan would have to cover such added costs, Tudor noted, but more important to any utility are safety concerns raised by putting extra gear in that tight space.

The vendor picked to trial gear on the underground portion of SMECO's grid failed to meet the deadline to deliver gear.

About 60% of SMECO's wires are underground thanks to a 1968 Maryland law requiring that all distribution line extensions go underground, said Tudor.

## Paradox of priority

Another hurdle to BPL would be the utility's policy on reconnecting BPL services versus electric service after an outage.

Obviously electric service gets the higher priority but that creates a paradox -- fix the BPL while already in the field or

pay for the crews to go back out for the BPL after the power is restored.

The utility didn't like the added expense of sending trucks back into the field for the BPL -- but doesn't like the idea of slowing power restoration with BPL work while the crews are out the first time.

Some answer to that dilemma might be needed for every access BPL deployment.

That said, most BPL gear probably doesn't need any repair after a power outage.

Fixing the power should do the trick.

Another problem for BPL in Maryland is state law keeping co-ops from serving anything but power and plumbing, said Tudor.

His firm owns fiber for utility automation and could make a case for deploying more and using the majority of the bandwidth -- say 20 or even 22 strands in a 24-strand optical fiber line -- as backhaul for a hybrid network that included BPL.

A hybrid network makes sense to Tudor.

Would access to the next generation of BPL hardware make a difference in SMECO's BPL plans, we asked.

The utility wants to be at the cutting edge -- not the bleeding edge, Tudor reported.

The utility will let other firms try out the latest gear.

The firm's pulling the BPL hardware back off its poles.

The ARRL published a report about the end of the trial without taking credit for closing it down.

The league "is unaware of any radio frequency interference complaints related to the SMECO BPL test," the group reported.

## State pushing net

SMECO may hold off on BPL until it sees how the utility's role with the Southern Maryland Regional Broadband Initiative changes the landscape for deployment.

Tudor told us about efforts in the state to create a rural broadband cooperative including a bill supported by a variety of legislators around the state (story this issue).

That task force -- created by the Tri-County Council for Southern Maryland in 2002 -- is trying to bring broadband to all of Southern Maryland by creating what Tudor called a broadband cooperative.

The initiative seems to be focused on fiber but lists BPL among the technologies under consideration.

Members from the Calvert, Charles and St Mary's chambers of commerce have had representatives on the Broadband Initiative's Technical Committee since 2002.