Re-File with corrected or better syntax.

Ladies and Gentlemen of the Federal Communications Commission

Comments on Proposed Rules on Broadband Power Line Systems Docket 03-104 and Docket 04-37

It is commendable for the Commission to further broadband access throughout the USA, however it appears to me the planned BPL systems are inadequate to serve such a purpose in the longer term. The bandwidths are too narrow and even further restricted when interference concerns are addressed. Carrier current systems are likely worthwhile for system control and an additional data link for industrial communications and lower data speeds to homes where retransmission redundancy can overcome interference are probably reasonable uses. The idea of "offering broadband services to the American home and consumers, and in bringing Internet and high speed broadband access to rural and underserved areas", to use the FCC's wording, is much closer to the ridiculous end of the spectrum than it is to the practical end of that spectrum.

It seems BPL is being "hyped" to make it seem important enough to pass over the likely interference to and from other services with simple platitudes. I see the following phrases embedded in the Docket:

"play an important role", "promoting the deployment", "expected to enhance the educational and social well-being", "facilitate the introduction", "new designs that can overcome these technical obstacles", "eliminating the need to install wires", "more effectively manage their electric power distribution", "provide an effective means for 'last mile' delivery", "we believe that Access BPL offers the promise of a new method for delivery of broadband services", "because power lines reach virtually every home, school, and business in the United States, Access BPL technology could play an important role in providing high-speed Internet and broadband services to rural and remote areas", "much of the infrastructure is already in place", "improve the safety and efficiency of the electric power distribution system", "promote continued US leadership in broadband technology", "We believe that Access BPL systems can operate successfully under the non-interference requirements of the part 15 rules."

Deployment of unlicensed spread spectrum RF BPL systems under Part

15 of the FCC rules
contains a high risk factor which is not being acknowledged yet.
My part 15 devices carry the
FCC warning label to the effect: "This device may not cause
harmful interference. " (ie: to
licensed services) and "This device must accept any interference
received," (ie: from licensed
services) "including interference which may cause undesired
operation".

This sounds good to other services and works well for the myriad
of devices available under Part
15 now. Garage door openers, RF remote controls, walkie talkies,
cordless phones, WiFi
computer linkages, car keys and others show the wisdom of having a
Part 15 definition.

However, BPL has some serious differences, in technical parameters
and the psychological
environment of the user. It is being deployed as a paid service
which causes a consumer to feel
he "owns" the right to use that spectrum and receive his service.
All understanding by the
consumer of the meaning of the Part 15 words about interference
will "go out the window." A
high deployment rate for BPL is likely to cause massive
complaints to operators, other services
and the FCC itself as other services disrupt or slow the BPL
service. Tests now underway
should be required to pass susceptibility requirements easily
envisioned from the present services
in the 1MHz to 80MHz range. I suspect no one of the Commissioners
has ever been on the
receiving end of a complaint by an angry consumer who just "knows"
the solution is that his
"stuff" works fine so long as the other service is off the air.

The FCC notice in the Federal Register of March 17, 2004
addresses the concern of interference
generation and susceptibility with the general concept of
dynamically "notching" certain
frequencies. This notice is worded in such a way to imply
simply avoiding frequencies where
BPL systems might cause interference to other services is a
solution.. Little attention is being
shown the susceptibility considerations. While in-band
interference to BPL systems can easily
be envisioned from police cars, military convoys, CB stations,
etc, the obvious one is the amateur
radio operator. When this operator aims his antenna in the
direction of nearby power lines and
transmits a signal of several volts per meter, will the BPL system
automatically detect and switch
frequencies and not be bothered or overloaded? Narrowband
equipment easily tunes out such
interference levels, however this signal is in the passband of the
BPL system and the neighbor's

wiring is only a hundred feet away.

Next, when it comes to the generation of interference by BPL systems, the concept that a commercial wideband frequency hopping spread spectrum pseudo noise generation system can be controlled by a simple Part 15 rule saying "may not cause harmful interference" is overly optimistic. The very wording itself of Part 15 implies some interference is to be expected but acceptable because of the intermittent low probability nature of that interference. Broadband BPL is on 24 hours a day. Very detailed (ie licensed) specifications are needed for BPL, similar to the radiation limits imposed upon cable TV systems. Power lines carrying 3 or 4 thousand volts are separated by 3 feet or so atop power poles and do not act as efficient transmission lines. They radiate. I have personally observed and unsuccessfully hunted for sources of powerline interference in an urban environment. It is a very difficult process. Cable TV is inherently shielded and yet leaks occur. My own neighborhood (which has underground power, telephone and cable) is permeated by a 145.25 MHz carrier 10dB above noise level in a 20-30 KHz passband, (and probably others). This is from an underground shielded system which typically runs signals of +10 dBmv (-38.75 dBm or .00000013 watts) through the "drop" cables to the homes. The approach to BPL should not be "innocent until proven guilty" but rather prove to skeptics that no problem exists.

I suspect the commissioners have not had the hands-on experience of tracking interference sources, especially a broadly distributed system which sounds like noise in most receivers. It is very difficult to pinpoint sources. To pit individuals against a system operator who is likely to be uncooperative without FCC required detailed radiated limit specifications and certification being imposed is simply putting one's head in the sand. It reminds me a bit of those nuclear power industry promotions which speculated nuclear power would be so cheap that we need not bill for electricity usage.

Radio astronomers and optical astronomers have always requested spectrum protection as they deal in very weak signals. Cities near optical telescopes have restrictions on lighting and the spectra emitted by that lighting. This is similar in the HF and low VHF spectrum, other services deserve similar protection, ie specifications which will preclude possible BPL interference.
Please refer to the FCC's own Report and Order of Sept 1997 at

http://www.naic.edu/techinfo/prcz/prczinfo.htm/ which illustrates this concern in establishing a protected zone at Arecibo. I understand Greenbank, WV has a similar protection zone. It appears to me BPL would not be allowed in these zones.

Finally, the BPL systems being proposed seem to me to be inherently stop-gap at best because of all the above limitations and the simple fact that power transmission systems were never designed to carry RF and not radiate it and they have less capability (lower bandwidth) to fulfill the desired "last mile" connection. The obvious answer is the massive bandwidth capability of optical fiber systems which consume none of the radio spectrum. The power companies already have rights of way to deliver broadband in a big way. This will relegate BPL to a niche when such fiber systems are deployed. The "cheerleading" should be to help power companies string fiber optic cables beneath those power lines and forget using the powerline themselves. The FCC itself is promoting "fiber to the home" deregulation. That is "real" broadband.

Having said BPL is likely to be a "niche", one might say "OK the other services need not worry about large scale deployments". Believing BPL is "stop gap", I agree. So the need is to be sure the systems really do behave as required by Part 15. Every consumer equipment needs the label described above in big bold letters. An FCC number to contact should be part of that label with a simple answering machine relating the same message. A required system of responses by a BPL operator to fix or shut off interfering signals should be inherent in attempting to place BPL under the Part 15 rules and all it should require is a simple call to the operator to trigger that effort. The designers and operators of such systems should demonstrate compliance to radiation limits less than ambient noise levels at 100 ft distance and susceptibility performance to handle the known levels of interference to be expected. BPL systems need operator licensing and a requirement for commercial licensed personnel on staff to assure technical compliance.

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