Before the
Federal Communications Commission
Washington, DC 20554

In the Matter of	)	
	)	
Carrier Current Systems, including	)	ET Docket No. 03-104
Broadband over Power Line Systems	)	
	)	
Amendment of Part 15 regarding new	)	ET Docket No. 04-37
Requirements and measurement	)	
Guidelines for Access Broadband over	)	
Power Line Systems		

REPLY COMMENTS ON NOTICE OF PROPOSED RULE MAKING

To: The Commission

After reviewing a number of comments in this proceeding, the following reply comments are provided.

INTERFERENCE TO ACCESS BPL

Neither the BPL equipment suppliers, nor the utility companies, nor the FCC have broached the subject of interference to BPL systems. This may well turn out to be a more important topic than that of interference from BPL systems. In light of the planned usage of these systems – VOIP, security monitoring, and power system monitoring and control, it would seem that this might be an important topic.

Only the AMRAD tests seem to provide any data regarding BPL susceptibility. It may be that the BPL equipment providers and power utilities intend to handwave away these concerns as they have the interference concerns. While it may be possible for the BPL manufacturers, utilities, and FCC to stonewall interference complaints for extended periods of time, and define harmful interference in a way that they find mutually beneficial, it will be much more difficult to deal with interference to BPL systems in the same way. If some, or all, of the BPL implementations are as susceptible as the AMRAD tests have indicated, it would seem that the FCC "cheerleading" of this technology may turn into a legal nightmare for both the utilities and the equipment manufacturers. Data

submitted in this proceeding clearly indicates that there is a susceptibility problem for at least some of the systems. The Potomac Electric Power Company system was the subject of AMRAD's testing. This data should provide ample fodder for future lawsuits when the companies involved have to explain why they ignored such a critical topic after being clearly informed that a susceptibility problem exists.

One can imagine that the response of the BPL community and utilities will be that the equipment will simply and automatically switch frequencies when interference is detected. That approach is fine and good if the front end of the BPL receiver is not overloaded by the signal. This may well may be the case when a completely "out of band" signal of significant magnitude exists. The opportunities for strong in band and out of band signals are numerous. Some likely candidates are AM broadcast stations, public service low band mobile and fixed, amateur radio, and CB. With the exception of AM broadcast, all of these services including CB (the FCC essentially gave up on enforcing the Citizen's Band service years ago) involve high power mobile transmitters. The AMRAD tests indicate problems at low power levels with inefficient, vertically polarized, antennas. The susceptibility problem will most likely be substantially worse when horizontally polarized antennas and higher power are employed.

Finding the source of interference will be challenging for the utilities. Many of the sources of interference will come from mobile transmitters and will be manifested as intermittent random failures. Some of the questions that will arise in troubleshooting the system are –

1. Is the intermittency caused by BPL equipment malfunction?
2. Is the intermittency caused by interference from fixed or mobile transmitters?
3. Is the intermittency caused by RF noise being generated by the power line itself?
4. Is the intermittency being caused by other wireless devices (telephones, 802.11x wireless networks, etc.) when 802.11x devices are deployed as part of the BPL system?

The only obvious solution to the susceptibility problem is to regenerate the signal at closer intervals on the line. Of course, this drives up system costs, particularly for rural areas.

Susceptibility is a topic, that the Commission, equipment suppliers, and utilities should address. Susceptibility will be addressed (eventually) whether any of the parties involved choose to participate or not. Disgruntled customers will discontinue service if service interruptions occur frequently. Customers damaged lack of service during a personal emergency will file lawsuits.

The FCC should clearly state in the rules for Access BPL that **no** action will be taken to limit the operation of licensed stations that interfere with BPL (Part 15) systems. This is stated in Part 15, but should be restated in more explicit terms, since every word of Part

15 will be analyzed for possible relief **when** problems occur. This fact is clearly illustrated by the current debate over the meaning of "harmful interference".

It is irresponsible to suggest that a Part 15 service be used for alarm systems and VOIP without first determining what the expected reliability of the system will be when fully deployed. The reliability cannot be established without susceptibility testing.

ACCESS BPL DATABASE REQUIREMENTS

With regard to a publicly accessible database, comments of both the utilities and the BPL equipment manufacturers make some good points. A publicly accessible database defining the location and operating frequencies of BPL system components will sometimes result in incorrectly identifying the BPL system as a source of interference. The security concerns addressed in several comments regarding location of utilities equipment assets are more farfetched. In general, the locations of most utility assets are in general view of the public even when underground utilities are used. The signals radiated by the BPL system will only make them easier to locate.

However, each BPL operator should have as a minimum, a webpage listing the telephone number and/or email address of the entity to be contacted for interference resolution. The entity responsible for interference resolution should be manned twenty four hours per day, seven days per week.

The dismal record of both the FCC and power utilities in resolving interference complaints in a timely manner make clearly defined interference resolution regulations an imperative. This topic will be addressed elsewhere in these reply comments.

INTERFERENCE REPORTING AND RESOLUTION

Most of the comments filed by BPL equipment suppliers and the power utilities concentrate upon Part 15 requirements and measurement criteria. Numerous comments (NTIA, ARRL, etc) have pointed out that the field strength regulations were written for point source emitters while BPL is clearly a line source radiator. The real point of emphasis should be whether the devices cause harmful interference to licensees. Lab test results are really irrelevant except to serve as a guide during deployment, and for Part 15 compliance. The requirement prohibiting harmful interference to licensed service will certainly be more difficult to achieve. These results will have many associated variables such as the distance of the receiving antenna from the interfering source, the gain of the receiving antenna, and the ambient noise level at the receiving station.

The Commission must establish a clearly defined system for reporting and resolving interference complaints.

The Commission clearly does not have the manpower to support interference complaints even in today's environment. Additionally, the U.S. taxpayer should not have to subsidize the costs of interference complaint resolution for private companies or private individuals. The cost should be borne by the company creating the interference or by the party who erroneously instigates an interference investigation. This will serve two purposes. First, there will be an incentive for the utility to make the system interference free, and secondly, their will be an incentive for the complainant to be certain that the utility is at fault, before filing a complaint.

For such a system to work, the BPL system must identify itself using some common, clearly defined, and easily recognizable signal. The modulation scheme would preferably be either AM or FM to allow ease of identification by a non-professional. There is no need for the identifier to be unique for a given device. All devices owned by the same utility could emit the same identifier if the utility so chooses. Since the utility will be responsible for eliminating the interference, the question of a unique identifier for each device would be a matter for the utility to decide.

The first step in the interference reporting and resolution process would be for the complainant to learn the modulation scheme and identifier employed by the system(s) suspected of causing the interference. This information should either be available on the web page of the utility or from the entity designated by the utility for interference resolution. This information should be supplied by the utility or designated entity via telephone or email at no cost. As long as this information is supplied or available on the web, there is no need for operating frequencies and physical locations of devices.

The complaint process should begin by the complainant contacting the utility or designee and receiving a "verification number" for the complaint that was filed. After a complaint has been filed, the BPL operator or designee would have twenty four hours to eliminate the interference. If interference still existed after twenty four hours, the complainant would have the option of contacting the utility again or invoking the services of an FCC certified interference specialist. The qualifications for an FCC certified interference specialist will be discussed elsewhere in the reply comment.

The FCC certified interference specialist would make measurements (per a FCC defined procedure) using the complainant's antenna(s) to determine whether the interference was indeed being caused by the utility and was of a level considered harmful (per FCC defined parameters). If the specialist determined that the utility was at fault, the utility would be responsible for the specialist's payment as well as subject to substantial fines by the FCC for each day the interference continued. The interference would not be considered eliminated until confirmed in writing either by the complainant or the interference specialist.

If the interference specialist determined that the interference was not being caused by the BPL provider, the complainant would be required to pay for both the utility's and interference specialist's time.

There should be no requirement for the complainant to advise the utility that an interference specialist has been contacted. There should be a requirement that the interference specialist make no contact with the utility until the investigation at the complainant's site is, at least, in progress. This will lower the probability that the BPL operator would shift frequency between the time of the complaint and the arrival of the interference specialist.

This approach puts the individual complainant at considerable risk that the interference may be eliminated between the time of engaging and the actual arrival of the interference specialist. This will have an unintended consequence of engaging a specialist in only the most persistent cases.

The Need for Independent Third Party Interference Resolution

The FCC has been unable to resolve interference complaints in a timely manner. As acknowledged by the Commission in NPRM 04-29 -

In considering this interference potential, we note that ARRL acknowledges that noise from power lines, absent any Access BPL signals, already presents a significant problem for amateur communication. We therefore would expect that, in practice, many amateurs already orient their antennas to minimize the reception of emissions from nearby electric power lines.

The Commission's view in the above statement is simplistic and incorrect. The great majority of antennas used by amateurs are of the single wire type at heights too low to exhibit any appreciable directivity, and are oriented as dictated by trees on the property. The Commission acknowledges by the above statement that power lines already are a significant source of interference.

Additionally, the complaints filed against Access BPL providers to date languish in the OET. Interference resolution needs to be handled quickly. In the long run it will be beneficial to all parties concerned. Either companies will quickly learn that the interference problems are real and unsolvable before investing huge sums of money, or they will learn what is necessary to deploy systems that are interference free. The worst nightmare will be achieved if large expensive systems are deployed while hoping that an answer will come someday. Even if the answer comes, much of the hardware may have to be replaced.

From personal experience with power line noise in the Norcross, Ga. area, several years ago, Georgia Power (Southern Company) interference specialists were poorly trained and completely ineffective. In this instance, it took a year and a half to get the interference eliminated. It only happened then, because I was lucky enough to have had a college classmate who sent a crew out, and told them to go to the pole number that I had identified a year and a half before. The point is, many power utilities do not have personnel capable of locating and eliminating the types of interference problems that they

have dealt with for nearly a century. Without a strong monetary incentive to eliminate interference, they will continue to plod along as the Commission has tacitly acknowledged.

In order to expedite interference resolution, there is a need for independent interference specialists located in multiple localities throughout the United States. These specialists should be tested by the Commission to determine that they are competent to interpret Commission developed rules and regulations concerning harmful interference. While these comments concern Access BPL, there is a great need for these specialists in resolution of "normal" power line interference cases. These same interference specialists should also be empowered to investigate "normal" (non-BPL) power line interference complaints.

The FCC should institute testing requirements for a "Certified Interference Specialist" as it has for other licenses over the years, such as the First Class Radiotelephone. The testing requirements could be made specific to the type of analysis required, such as a Power Line Interference endorsement.

The Commission is not staffed to handle large number of interference complaints, nor should it be. The cost burden should be borne by the companies and individuals involved.

There will be an incentive by both individuals and the companies involved to resolve interference cases quickly, if the loser bears the cost of the investigation and applicable fines.

Since the Access BPL system operators are already certain that they will cause no "harmful interference", such a system would impose little if any financial burden.

Final Comments

This technology does not appear to be the answer to broadband service for rural America. The National Rural Telecommunications Cooperative and National Rural Electric Cooperative comment –

The organizations share the desire for rapid BPL rollout, and at the same time caution the FCC that BPL deployment is years from economic feasibility in rural areas. Technical concerns such as signal distance and shared bandwidth combined with economic realities of low density continue to create concerns about the deployment of BPL to rural areas.

BPL constitutes a threat not an enhancement to emergency communications and Homeland Defense. The NTIA, FEMA, DERA, Boeing, the ARRL, and many others have stated that BPL constitutes a threat to emergency and public safety communications.

If the Commission allows a BPL rollout to proceed without adequate regulations to preclude interference, it can and will bear full responsibility for any future communication's disaster involving BPL.

This NPRM proceeding is obviously rushed and inadequate. The NPRM document is extremely general and lacking in detail. The lack of detail creates difficulty in generating specific comments.

I am amazed at how the Commission has avoided the use of technical data. There also seems to be an attempt by the Commission to divorce itself from any first hand knowledge of the interference potential of the BPL systems. I fear that you plan to say that you relied upon "bad" data. The Commission is responsible and will be held accountable for the result. It is your responsibility to regulate from data that you have confirmed to be accurate. There is lots of data "out there", and none of it portends any thing but trouble. The German BPL systems are operating at levels several orders of magnitude below Part 15 limits, and still create interference problems.

Yours sincerely,

Zollie R. Compton, Jr.