I will state first that I do not currently work in this field. However, I am an electrical engineer with 40 years of experience, primarily in RF and data communications, telephone modem and filter design, and design of communications semiconductors. I am also a radio amateur, first licensed in 1956, and very experienced in MF and HF weak-signal work. I have had considerable experience with networks, and RF transmission and modulation techniques.

I believe that my experience both as an electronics professional and a radio amateur qualifies me to offer some general comments here on the subject of interference to other services..

I have read the Commission's NOI and relevant material published by IEEE on this subject.

It is understandable that the Commission is excited and enthusiastic about the potential technological, social and economic benefits of PLC. It is gratifying that the Commission is aware of and acknowledges the many and serious technical challenges that must be met before this technology can be implemented on a wide scale.

Nonetheless, one can infer, from the statements of the Chairman and Commissioners appended to the NOI, and from public statements attributed to the Chairman, that PLC is so politically attractive as a concept that there is a finite and significant risk that political considerations might overshadow technical issues. (This would hardly be without precedent in this and prior Administrations.) An undesirable result would be to prematurely deploy systems that could create significant interference to other services. This could be catastrophic to those services suffering such interference.

Amateur radio communication on MF (160 meters), HF (80 through 10 meters) and low VHF (6 meters) is especially vulnerable to either direct interference or to a rise in background noise levels. State-of-the-art MF/HF amateur equipment is capable of reception of signals considerably below -120 dBm. Given that directional antennas employed by many amateurs provide forward gain on the order of 6 to 10 dB, minimum discernible signals are less than receiver thresholds by that amount. These are signals of fractional-microvolt magnitude. While it is true that amateurs in dense urban or suburban environments rarely enjoy noiseless bands, those in rural areas do. Even those in noiser surroundings are still able to copy microvolt signals. I, in fact, am one of those.

The Commission must take care to ensure that it considers threshold signals, and does not utilize "average", "typical", or "expected" magnitudes of received signals in calculating the effects of BPL systems.

Several of the modulation schemes proposed for BPL involve multiple carriers spaced throughout the operating spectrum. Under no circumstances should these carriers be allowed in the MF and HF amateur bands.

Such situations have in fact already occurred. Several years ago, at least one manufacturer of "wireless jacks" for wireless cable use released thousands of units into the marketplace in several regions of the U.S which transmitted between 3.525 and 3.550 MHz. Until the cable company and its successor were able to locate and replace these jacks (at enormous cost), that portion of the 80 meter amateur band was essentially useless in those areas.

I am particularly concerned about the effects--still largely unknown---of shared user (last 100 feet) environments, such as homes or apartments sharing a MV/LV transformer. In such situations, one customer's inside equipment may create intolerable interference for others on that transformer.

The modeling and pilot projects described in existing BPL literature attempt to quantify expected variations in customer loads and customer premise wiring. What I do not see modeled---and which may not be amenable to computer modeling--are the effects of non-time invariant and unstable customer loads on BPL signals. From personal experience, I know that such loads cause interference by themselves. (I tolerate no dimmers or touchswitches in my home, and have actively tracked down and replaced a number of such devices in my neighborhood within a radius of several hundred meters which have caused significant intereference to my amateur radio operations.)

What concerns me here is that the Commission has historically been either unconcerned or unwilling to deal with these relatively simple devices, despite their being well-known as unintentional radiators. (The only "action" taken to mitigate these devices, to my knowledge-- has been the suggestion to manufacturers by the Electronic Industries Association (EIA) to include RF filtering on all units sold---a suggestion almost universally ignored.) What, then, would be the Commission's response to a flood of poorly-designed BPL products in the marketplace when consumer complaints roll in?

Another, more serious problem has been the historical unwillingness of power companies to respond to customer complaints of RFI from their equipment to amateurs and other spectrum users. This has ranged from arrogant indifference to outright hostility. I myself have battled with our local utility over rotten hardware, failed insulators, untrimmed trees touching MV lines and other problems for well over a decade. Commissioners need only consult their own Enforcement staff (particularly Mr. Riley Hollingsworth) to ascertain the extent of the problem. (I should add that Mr. Hollingsworth is doing a superb job with minimal staff.)

Many of these same power companies are anxious to install and operate BPL systems. One can only wonder to what extent these companies will be concerned with interference issues---and what the Commission's view toward these issues will be.

It is interesting to investigate the view of the utilities regarding possible interference to their own operations. Recently, the American Radio Relay League (ARRL) asked FCC to approve a sliver of bandwidth at 137.5 kHz for amateur experimentation. This was not a radical proposal---such an experimental band has been in use in Europe for some years.

The Commission turned down the proposal, citing concerns raised by power utilities already utilizing their distribution systems to some extent for low data-rate supervision and control. These uitilites raised the specter of problems that might be caused by interference from this proposed longwave allocation.

The rejected 137.5 kHz allocation called for low power transmission. Since the wavelength is 2181 meters, practical antennas would, of necessity be extremely inefficient, resulting in effective radiated power of less than 1 Watt in any conceivable circumstance. Further, the number of amateurs likely to become involved at that frequency would certainly be very small. It may be surmised from the extremely low ERP and the low number of users that such transmission would be highly unlikely to cause interference to any other service. Nonetheless the power companies actively opposed it, and the Commission cited their concerns in denying the application.

The point here is that the power companies--who stand to profit hugely from successful deployment of BPL-- are rather more conservative when it comes to the possiblity of another service interfering with their operations than they appear to be about causing interference to other services. I hope this irony is not lost upon the Commission.

Sincerely,

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