

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)
)
Inquiry Regarding Carrier Current) **ET Docket No. 03-104**
Systems, Including Broadband Over)
Power Line Systems)

To: The Commission

**REPLY COMMENTS OF
PETER G. SMITH**

The reply comments that follow are in response principally to the comments of the American Radio Relay League (ARRL) and those of Main.net Communications Ltd. (Main.net). The undersigned is an Extra Class Amateur Radio Licensee (N4ZR), active on the Medium Frequency (MF) and High Frequency (HF) Amateur allocations since 1954. I live in a rural area of Eastern West Virginia, which is already served by cable Internet and DSL broadband service; hence, from my perspective, it is difficult to see any advantage to consumers here arising from the introduction of BPL. Nonetheless, accepting the Notice of Inquiry's premise that BPL could meet an unfilled consumer demand, the remainder of my reply comments addresses the technical and regulatory issues surrounding the proposed solution.

I strongly endorse the direction and substance of the ARRL's comments, which correctly identify the two-sided dilemma posed by the proposed Access BPL service; that it will both cause very significant interference to MF and HF amateur operation and be almost inevitably subject to significant interference from licensed Amateur operation. If deployment of Access BPL is permitted, as ARRL observes, the result will inevitably be a huge surge of licensee and consumer

complaints about mutual interference, which neither the power companies nor the FCC are prepared to handle.

Let me bring this down to specifics. I frequently engage in communication using Single Sideband voice and CW telegraphy with stations that are very weak. In many cases these signals are only a few dB above the ambient noise floor. The ARRL says that, based on its modeling, “received signal levels of BPL noise at typical amateur stations are, in worst cases, between 33.7 and 65.4 dB higher than typical ambient noise levels.” If this were to be the case in my area, I would be effectively precluded from carrying out a majority of the communications I now conduct. These have, in the past, and may in the future include participation in domestic and international emergency communications. Particularly in the latter case, signals from stations in disaster areas are frequently so weak that any significant elevation in the local noise floor due to BPL could effectively prevent reception of important communications bearing on the health and welfare of disaster victims.

Because I operate with over 1000 watts output in each of the HF bands, with antennas having gain of 7-12 dBi, my station’s EIRP is on the order of 5-15 kW. In an earlier proceeding this year, in denying the ARRL’s request for a new low frequency allocation, the FCC based its decision in large part on concerns that Amateur signals of 1 watt EIRP would cause harmful interference to operational PLC signals at distances of over 900 feet. Imagine, then, the virtual certainty of interference (which, under Part 15, BPL must accept) from 5-15 kW EIRP signals emitted within 250 feet of elevated power lines.

One other technical point -- it is well known that balanced cables, such as telephone twisted pairs, are relatively less likely to radiate than asymmetrical lines. In my area, which may be representative of the rural areas where BPL proponents argue their system is needed to provide

economic broadband Internet access, the medium voltage feed is provided by a single phase, plus neutral; this highly asymmetrical system, if used for BPL in the 2-30 MHz range, would almost appear to be deliberately optimized for the radiation and interception of radio frequency energy.

Turning now to Main.net's comments, which appear to be broadly representative of those from advocates of BPL, I was struck by their attempt to gloss over the very serious debate currently going on elsewhere in the world regarding the introduction of BPL. To judge from statements on pages 2 and 3 of Main.net's comments, one might conclude that implementation of BPL in countries such as Germany is a trouble-free *fait accompli*. Nothing could be further from the truth. See, for example, the recent articles by Diethard Hansen, founder and president of EES (1991) Switzerland and Germany, in *Compliance Engineering Magazine* (http://www.ce-mag.com/archive/03/ARG/hansen1_and_hansen2.html), which survey the situation in Europe. Hansen notes, *inter alia*, strong opposition in Germany and many other countries to the deployment of BPL and test results demonstrating serious problems of mutual incompatibility between BPL and other licensed radio services. For example, "PLC interference has been identified as other background ambient in bands <30 MHz, receiver jamming (desensitization), and time-variant EMI. It takes wireless experts to confirm that the cause is PLC and not other EMI. Normally at continuous wave (CW), amplitude modulation (AM), and single sideband (SSB), the whole receive spectrum is experiencing a massive noise-floor increase (which sounds like an old steam locomotive sometimes), resulting in total blocking. Sensitivity is wiped out."

In the face of clear and detailed evidence to the contrary, assertions by Main.net and others that no interference with licensed Amateur Radio operations will occur are, at best, fanciful. It is fairly stunning when Main.net says, on page 6 of its comments, "Although there is some theoretical concern regarding interference to Amateur Radio operations below 30 MHz, Main.net's experience, including operation in the homes of active Amateur Radio licensees, has

been that there is no interference. Part of the reason for this is likely that Amateurs typically install their antenna outside.” I would submit that it is more likely that the Amateur Radio licensee in question was not active on the MF or HF bands, or the experience would more closely parallel the highly destructive interference found in Europe, whether or not the Amateur knew that the interference was coming from BPL. Moreover, the potential for interception of Amateur signals radiated by large outdoor antennas by lengthy medium voltage transmission lines is precisely the worst case that the FCC, in the previous LF allocation proceeding, focused on.

Lest the Commission conclude that the positions taken by Radio Amateurs are self-serving complaints by a few hobbyists, without broader implications, I recommend that its staff review the list, compiled by the publication *Monitoring Times*, of 1000 different HF frequencies used by US and other governmental and public service organizations, which may be found at www.monitoringtimes.com/html/mttpHF.html. Operations of each of these licensed users would potentially be jeopardized by premature deployment of BPL.

Hansen concludes part 2 of his article by stating:

PLC technology, in principle, is potentially attractive, if it were to become compatible with existing telecom technologies. PLC technology is still premature in terms of EMI prevention. PLC has little to offer over the competitors and certainly does not justify more EMI. Standards will evolve relatively slowly. The requirement of the EMC Directive with harmonized norms (to conducted EN 55022) are not met by most PLC systems, regardless of the stricter limits of regulations such as NB 30.

It is unlikely that PLC will experience widespread application under its currently implemented status. With delays in implementation and lackluster client acceptance, even the business case is becoming less attractive.

In conclusion, I urge the Commission to engage the ARRL, NTIA, DOD, FAA, BIB and other representatives of licensed users of the MF and HF spectrum in extensive and detailed testing of

BPL's compatibility with licensed services. It should not proceed with deployment of BPL, unless and until the technologies employed therein can be proven to avoid the potential for destructive interference from and to licensed operations.

Respectfully submitted,

Peter G. Smith

August 19, 2003