

**Before the  
Federal Communications Commission  
Washington, DC 200554**

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

**To: The Commission**

**REPLY COMMENTS OF MR. EMIL F. HOMUTH, GEOPHYSICIST,  
LOS ALAMOS NATIONAL LABORATORY**

1. I submit these Reply Comments on the subject docket in reply to comments provided by the ARRL, the National Association for Amateur Radio.
  
2. As a geophysicist who uses the radio spectrum to conduct geophysical and atmospheric research, I am extremely concerned with the severe interference potential of **Broadband over Power Line (BPL)** systems operating in the 1.7 MHz to 80 MHz range to the many users of the MF/HF/VHF spectrum. Although a few discrete frequencies or band segments have been allocated for geophysical and atmospheric research use on a priority non-interference basis, most geophysical and atmospheric research involves monitoring and studying large portions of the MF/HF/VHF spectrum using naturally occurring weak signals or other EMF phenomena. The increased use of unlicensed Part 15 type devices has already caused a significant rise in the MF/HF/VHF noise floor in many parts of the country/world to the detriment of many geophysical research activities. The proposed use of access and local BPL would dramatically raise the MF/HF/VHF spectrum interference and noise floor to unacceptable levels over large areas. The ARRL has filed valid comments, calculations, technical data, and supporting field measurements that show the severe interference potential of BPL systems to all MF/HF/VHF spectrum users. My comments are in reply to and provide support for the various ARRL comments.
  
3. The ARRL represents radio amateurs and says its' comments mainly apply to the Amateur Radio Service, but since the Amateur Radio Service uses "bands" from 1.8 MHz to 52 MHz (i.e., the MF/HF/VHF spectrum) their comments also address the potential broad spectrum interference issue for other spectrum users. I quote in part their item #1 comment, "*ARRL's view, after extensive technical investigation and experience with Part 15 devices generally, with power line interference problems, and with Power Line Carrier (PLC) systems, is that **there is severe interference potential from BPL in***

*the bands between 2 and 80 MHz to Amateur Radio stations. This interference potential, as a matter of both law and fact, disqualifies access BPL as a potential future competitive broadband delivery system. ARRL is cognizant of the fact that BPL is permitted under present Part 15 regulations. However, the interference potential from access BPL systems is as yet unrealized, as they are not yet deployed. BPL is a Pandora's Box of unprecedented proportions.<sup>1</sup> The Commission's Part 15 rules should be modified so as to prevent interference to users of the HF and low VHF spectrum ab initio, and to prevent consumers' reliance on BPL as an interference-free broadband delivery system".*

I strongly support this and the other comments the ARRL has presented concerning the potential for severe interference to the many spectrum users from all forms and configurations of BPL broadband data transmission. (**bold emphasis- efh**)

4. ARRL's calculations also show BPL access power lines will act as high efficiency radiators producing large amplitude MF/HF signals capable of propagating over long distances. This uncontrolled radiation must be considered as potential severe interference to all MF/HF spectrum users. Thus BPL systems are incidental radiators and must be controlled and limited in a rigorous manner. The various AC power distribution systems were simply not designed and are unusable for high-speed data transmission purposes, regardless of what BPL proponents may argue.

5. ARRL's recent noise measurements near several BPL system trial communities in New York, Pennsylvania, Virginia, and Maryland (along with previous BPL noise measurements conducted by radio amateur, engineering organizations, and governmental agencies in Germany, Japan, Finland, England, Austria, and Holland) demonstrate that power lines used for BPL (even at current Part 15 power levels) radiate unacceptable levels of energy in the MF/HF/VHF spectral bandwidth. These large uncontrolled and unpredictable radiated noise signals will adversely affect almost all MF/HF/VHF spectrum users who work at low signal levels, such as geophysical, atmospheric, and RF propagation research organizations.

6. Similar measurements showing the excessive radiation of noise from power line BPL has resulted in its rejection for use in the technologically advanced countries of Germany, Japan, and Finland; further demonstrating the futile and unusable character of this technology. The ARRL's measurements support the technical basis for these rejections. Please leave the distribution of high-speed broadband data signals to DSL, fiber optic, cable TV, and other "contained" distribution systems that are more appropriate for this mode of data transmission.

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<sup>1</sup> BPL is qualitatively different as an interference source relative to DSL. BPL is a unique system that uses entire swaths of spectrum; a physical construction that occupies entire communities; a shared wiring system that puts neighbor's BPL system on the same conductors that feed multiple houses from the same power transformers; and the use of widely spaced overhead wiring that by its own geometry forms an effective radiating antenna. Other systems such as DSL may be physically large, but the use of twisted-pair wiring, and the fact that current DSL systems stop at 1.1 MHz creates an entirely different interference potential.

7. Based on the above information, I request that the Federal Communications Commission take no further action to allow the deployment of access or in-building BPL systems operating in the 1.7 MHz to 80 MHz frequency range.

8. I present these comments as my personal unsolicited scientific opinion on this issue. They do not represent those of my employer, the Los Alamos National Laboratory or the U.S. Department of Energy.

Respectfully submitted,

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