

DOCKET FILE COPY ORIGINAL

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

RECEIVED & INSPECTED

AUG 22 2003

FCC - MAILROOM

In the Matter of)

Inquiry Regarding Carrier Current)
Systems, Including Broadband Over)
Power Line Systems)

ET Docket No. 03-104

To: The Commission

**REPLY COMMENTS OF
THE POTOMAC VALLEY RADIO CLUB**

Jack C. Hammett, President
40282 Doe Run Lane
Paeonian Springs, VA 20129

Prepared by:

Michael D. Lonneke
20732 Furr Road
Round Hill, VA 20141

James M. Talens
6017 Woodley Road
McLean, VA 22101

No. of Copies rec'd _____
List ABCDE _____



Filed: August 20, 2003

SUMMARY

The Potomac Valley Radio Club, Inc (“PVRC”), a non-profit Amateur Radio organization with over 750 active members, strongly supports the American Radio Relay League (“ARRL”) in its opposition to the Broadband Power Line (“BPL”) initiative currently before the Commission in this proceeding.

As the ARRL demonstrates in its detailed technical study, BPL will have a massive, harmful radio frequency interference impact on licensed Amateur Radio across the Nation. Due to the physics of power lines and the radio frequencies that the power companies will use, BPL will increase the radio ambient noise level so that weak signals will no longer be receivable in any area where BPL is deployed. This will profoundly undermine the ability of Amateur Radio operators to serve as a national emergency communications resource in the event commercial communications facilities are damaged or destroyed by a natural occurrence or terrorist attack.

As the ARRL also shows, Amateur Radio stations will unavoidably cause interference to BPL receivers. Ubiquitous deployment of BPL will mean large scale consumer dissatisfaction with reception of data and a nightmarish public relations challenge for Amateur Radio operators, the Commission and Congress.

PVRC strongly urges the Commission to terminate this proceeding and reject BPL as a technology for use in spectrum allocated to the Amateur Radio Service.

Table of Contents

SUMMARY.....	ii
I. INTRODUCTION.....	1
II. PVRC SUPPORTS ARRL'S CONCLUSIONS REGARDING THE DANGER OF ACCESS AND IN-BUILDING BPL.....	2
A. BPL's Interference Potential Disqualifies Access BPL As a Viable Service.....	3
B. BPL Poses a Grave Danger to Emergency Services Provided by Amateur Radio Operators.....	4
C. The Power Industry Cannot Deal With Radio Frequency Interference Issues	5
D. BPL Would Be Susceptible to Massive Interference by Existing Spectrum Users	6
E. ARRL's Study Demonstrates that BPL Will Interfere With a Broad Range of Services	7
F. The American Consumer Is Unaware of What BPL Portends.....	8
III. CONCLUSION.....	9
EXHIBIT.....	i

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

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

**REPLY COMMENTS OF
THE POTOMAC VALLEY RADIO CLUB**

I. INTRODUCTION

The Potomac Valley Radio Club, Inc. ("PVRC") respectfully submits its reply comments in response to comments filed in the Commission's *Notice of Inquiry* ("NOI") in the above-captioned proceeding.¹ The NOI requested information on the current state of Broadband Power Line ("BPL") technology and the impact its implementation would have on other services.

PVRC is a non-profit Amateur Radio organization with over 750 active members located throughout the Mid-Atlantic States. For the reasons discussed below, PVRC strongly supports commenters such as the American Radio Relay League, Inc. ("ARRL") who urge the Commission to take no further action toward permitting access or in-building BPL in the high-

¹ *In the Matter of Inquiry Regarding Carrier Current Systems, Including Broadband Over Power Line Systems*, ET Docket No. 03-104, 68 Fed. Reg. 28182 (June 2, 2003), *corrected* 68 Fed. Reg. 32720 (June 2, 2003) [dates corrected].

frequency ("HF") or very-high frequency ("VHF") bands. Any other outcome would severely undermine the public interest by critically weakening a vast national emergency communications resource.

PVRC's members are Commission licensees who vigorously pursue Amateur Radio avocational activities on the HF and VHF bands. The vast majority of them are also capable of providing emergency communications services at times of national, regional or local need, using sophisticated stations they have gone to great personal expense to assemble. Importantly, they practice their communications skills in the context of periodic contests that are organized by a variety of national and international organizations.

A key to success in such contests is the ability of the participants' Amateur Radio stations to detect exceedingly weak signals from other stations, and under such conditions receive critical streams of data. It is precisely this capability that would be required in the event of an emergency where commercial communications facilities were disabled or destroyed.² With this background, PVRC now offers its detailed support for ARRL's submission, supplemented with further empirical information and observation.

II. PVRC SUPPORTS ARRL'S CONCLUSIONS REGARDING THE DANGER OF ACCESS AND IN-BUILDING BPL

In its comments, ARRL points out a variety of serious infirmities regarding BPL and the effects it would have on HF and VHF spectrum users, particularly in the Amateur Radio

² Many Amateur Radio operators have emergency power systems, battery-powered equipment, portable antennas, mobile stations, multi-mode communications capabilities, etc. Indeed, Amateur Radio is well recognized as a national resource for emergency communications. One need only recall the 9/11 events to appreciate the enormous service that Amateur Radio operators provided

service. We agree that the Commission's Part 15 rules should be modified now in order to prevent interference to current and future users of the HF and low VHF, and to prevent consumers' reliance on BPL as an interference-free broadband delivery system. It is not interference-free and once unleashed will essentially destroy the viability of many other services. Accordingly, we also agree with ARRL that BPL's interference potential disqualifies access BPL as a potential future competitive broadband delivery system.

Further, PVRC agrees that BPL presents a huge potential source of general radio frequency ("RF") pollution, a concern based on the nature of the proposed service itself as well as the many years of experience with power companies' treatment of interference complaints. It is also true, as ARRL demonstrates, that BPL will face untold interference from all levels of Amateur Radio transmissions at virtually every home expecting to use BPL as yet another broadband medium.

A. BPL's Interference Potential Disqualifies Access BPL as a Viable Service

In its comments, ARRL discusses a "severe interference potential from BPL in the bands between 2 and 80 MHz to Amateur Radio stations."³ PVRC agrees with the ARRL assertion that while BPL is permitted under present Part 15 regulations, BPL's interference potential disqualifies access BPL as a potential future competitive broadband delivery system. Further, PVRC believes that the ARRL statement, "the interference potential from access BPL systems is as yet unrealized, as they are not yet deployed. BPL is a Pandora's Box of

on-site, as well as at virtually every natural disaster that has occurred over the years in the United States.

³ ARRL Comments at para 1

unprecedented proportions”⁴ is entirely true. Moreover, this concern applies equally to BPL’s possible effect on all HF and VHF spectrum users, be they Amateur Radio service licensees or any others, and it is frightening to contemplate.

B. BPL Poses a Grave Danger to Emergency Services Provided by Amateur Radio Operators

ARRL discusses the critically important use of HF and VHF Amateur Radio bands for disaster relief communications and for a series of other public safety communications functions.⁵ Immediately adjacent to amateur HF allocations are numerous allocations for governmental communications channels including those for the Federal Emergency Management Agency and various military and intelligence services. Other allocations in the HF range (and near bands allocated to the Amateur Radio service) authorize over-the-ocean HF frequencies for international airlines. An HF communication from any airliner in mid-ocean with a safety or security issue could be masked by wideband noise from BPL.

As mentioned earlier, PVRC members often deal with weak signal communications situations, not only in the context of contests where critical operating skills are practiced but also in real-life emergency situations. Therefore, any increase in the noise spread across any HF or VHF amateur bands would mask weaker signals, whether in a radio contest environment, from an aeronautical source or from a boater or a hiker in distress.

PVRC notes that the Commission, in the enforcement of a “National Radio Quiet Zone,” has demonstrated its sensitivity to the nature of and risks of RF pollution.⁶ BPL

⁴ *Id.*

⁵ *Id.* at para 2.

⁶ The National Radio Quiet Zone (“NRQZ”) was established by the Commission in Docket No. 11745 (November 19, 1958) and by the Interdepartment Radio Advisory Committee in Document 3867/2 (March 26,

constitutes a serious example of electromagnetic pollution that would affect nearly every licensed Amateur Radio operator (and virtually every other) HF and VHF spectrum user.

PVRC also notes that the typical Amateur Radio receiver is an exceptionally sensitive device, and that is necessary to receive signals in environments of marginal propagation or where the transmitting station is limited to very low power, such as in an emergency situation. BPL would be implemented on a ubiquitous basis, causing interference to and receiving interference from Amateur Radio and other services in virtually every community in the United States. It should be evident that there is an incompatibility based on physics that does not allow BPL to coexist with other radio services in the HF and VHF spectrum. These concerns will be discussed in greater detail below.

C. The Power Industry Cannot Deal With Radio Frequency Interference Issues

In its comments, ARRL relates the on-going struggle the Amateur Radio Service has experienced for many years with terrestrial interference in the HF bands. PVRC can corroborate through the considerable experience of its members the ARRL's assertion that "a principal source of reported interference is above-ground power lines."⁷ For its part, PVRC can state with certainty that the nation's power distribution system has systematic and pervasive maintenance challenges, typified at the local level by loose hardware and defective components.

1958) to minimize possible harmful interference to the National Radio Astronomy Observatory in Green Bank, WV and the radio receiving facilities for the United States Navy in Sugar Grove, WV. The NRQZ is bounded by NAD-83 meridians of longitude at 78d 29m 58.0s W and 80d 29m 58.5s W and latitudes of 37d 30m 0 9s N and 39d 15m 0.8s N, and encloses a land area of approximately 13,000 square miles near the state border between Virginia and West Virginia.

⁷ *Id* at para. 3.

The Commission's own Enforcement Division and Consumer Inquiries and Complaint Division is often called into action because power companies seem so often to be non-responsive to entreaties from Amateurs to cure obvious power line problems. For example, as recently as July 11, 2003, the Deputy Chief, Consumer Inquiries & Complaint Division, Consumer & Governmental Affairs Bureau at the Commission directed letters to power companies in Columbus, Ohio, Akron, Ohio and Memphis, Tennessee. These letters called power line interference complaints to the attention of company executives after the companies ignored earlier bona-fide complaints⁸

PVRC observes that many power companies have required and continue to require the intervention of the Commission to resolve interference complaints. And this is the situation as it exists today. Based on the behavior of power companies today, one could hardly believe that these companies would address and resolve the onslaught of major interference complaints that would accompany implementation of any BPL system.

D. BPL Would Be Susceptible to Massive Interference by Existing Spectrum Users

In its comments, ARRL has pointed out that the Commission recently refused to grant an Amateur Radio allocation in the 136 kHz band. The Commission found that the power-line carrier ("PLC") signals in this band, by which power companies control their distribution equipment remotely, might be adversely affected by Amateur Radio signals, even those as weak as one-watt EIRP.⁹ Independent of the wisdom of this decision, it cannot be controverted that were BPL to be authorized, hundreds of thousands of Commission-licensed Amateurs Radio

⁸ See Exhibit I, reproduced letters from Sharon Bowers, FCC Consumer and Governmental Affairs Bureau.

operators, complying with all applicable Commission Rules and transmitting anywhere from 5 watts to 1,500 watts with antennas located within ten meters of medium-voltage (“MV”) power lines would easily obliterate virtually all HF and VHF BPL signals. Such a situation cannot be permitted to unfold, either for consumers who would face massive degradation of service, for Amateur Radio operators who would be unfairly blamed, or for the Commission that would face untold public and Congressional criticism for having created such an environment.

E. ARRL’s Study Demonstrates that BPL Will Interfere With a Broad Range of Services

In its comments, ARRL has provided the Commission with an excellent study of what happens when MV power lines become antennas.¹⁰ One of the most telling and chilling results of the ARRL’s study is shown in Figure 5 of the exhibit. It shows that at 5 MHz and above, power lines become efficient antennas, radiating the very BPL information they are intended only to conduct. Rather than just transporting data to end users, BPL becomes a ubiquitous array of broadband HF and VHF “transmitters attached to antennas.”

When the Commission authorized five amateur frequency channels in the 5.3-5.4 MHz range earlier this month, it cooperated with the National Telecommunications and Information Administration (“NTIA”) to avoid interference from other users of the nearby spectrum. It was for this reason that only five fixed frequencies with a maximum ERP of 50 watts were authorized. ARRL has clearly demonstrated that at 5 MHz power lines really do start becoming efficient radiators. That efficiency increases with frequency, so all users of the spectrum would be subjected to interference and/or noise level increases in their authorized

⁹ *Id* at paras. 5-6. See also, *Report and Order in ET Docket No. 02-98*, released May 14, 2003, at para. 18.

bands, including NTIA-licensed operators. PVRC strongly recommends that the Commission consider carefully and give great weight to the technical studies provided by ARRL in this proceeding.

F. The American Consumer Is Unaware of What BPL Portends

The potential for interference to and from BPL is enormous, as the Commission surely now must appreciate. As ARRL noted, an Amateur Radio station operating at 1500 watts and using a 3-element parasitic Yagi antenna would produce a peak field strength 100 feet away in the main antenna lobe of approximately 30 V/m. Most industry standards for immunity of consumer-grade electronics require that the equipment be non-responsive to fields of approximately 3 V/m. However, there is nothing in the record to suggest that BPL will not operate in excess of this immunity threshold, particularly in view of the ability of power lines to act as exceedingly efficient (and even directive) antenna arrays.

Thus, a significant concern for the Commission should be the extent to which BPL would adversely affect the operation of a broad range of unlicensed RF devices and services, either by causing or receiving interference to or from those services. Amateur Radio operators, as licensed and responsible users of the spectrum, would instantly be identified as the source of interference to BPL operations, a situation that would be at best untenable and ultimately disserving of the public interest

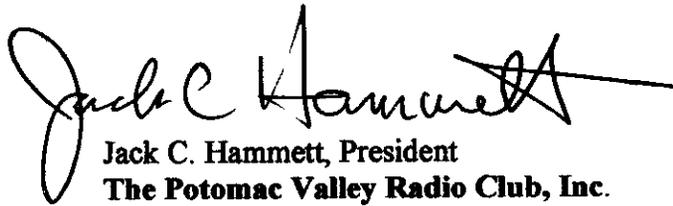
¹⁰ See ARRL Comments, Exhibit A, "Power Line Antennas from 0.1 to 30 MHz"

III. CONCLUSION

For the reasons discussed herein, PVRC strongly urges the Commission to reject BPL as a new broadband service competitor. There are sufficient alternative sources for broadband transport available that do not cause damage to other important services. Moreover, by relying on HF and VHF spectrum, particularly bands currently authorized for use in the Amateur Radio Service, BPL providers will inexorably cause harmful interference to Amateur Radio communications, either directly or by increasing the ambient noise levels in the Amateur Radio spectrum. Such detrimental consequences will seriously undermine the ability of Amateur Radio to fulfill its mandate under the Communications Act as a national volunteer emergency communications resource. That consequence cannot be permitted to unfold.

PVRC urges the Commission to resolve the future of BPL by terminating this proceeding with a finding that BPL is simply not technically compatible with existing services and would be detrimental to the public interest.

Respectfully submitted,



Jack C. Hammett, President
The Potomac Valley Radio Club, Inc.
40282 Doe Run Lane
Paeonian Springs, VA 20129

EXHIBIT I

On July 10 and 11, 2003, Sharon Bowers, Deputy Chief, Consumer Inquiries & Complaint Division, Consumer & Governmental Affairs Bureau, FCC, sent letters to company executives who had failed to respond to complaints about interference. These letters included the following recipients:

Mr. Herman Morris, Jr.
President and CEO
Memphis Light Gas and Water
220 S. Main St
Memphis, TN 38103

Mr. E. Linn Draper, Chairman
American Electric Power Company
1 Riverside Plaza
Columbus, OH 43215

Mr. Peter Burg, CEO
FirstEnergy Corporation
P O. Box 3687
Akron, OH 44309

The substantive contents of the letters were as follows:

Dear []:

The Federal Communications Commission has received complaints that equipment operated by Jersey Central Power & Light may be causing harmful radio interference to an operator in the Amateur Radio Service. The complainant is:

[complainant redacted]

The FCC has the responsibility to require that utility companies rectify such problems within a reasonable time if the interference is caused by faulty power utility equipment. Under FCC rules, most power-line and related equipment is classified as an "incidental radiator." This term is used to describe equipment that does not intentionally generate any radio-frequency energy, but that may create such energy as an incidental part of its intended operation.

To help you better understand your responsibilities under FCC rules, here are the most important rules relating to radio and television interference from incidental radiators

Title 47, CFR Section 15.5 General conditions of operation.

(b) Operation of an intentional, unintentional, or incidental radiator is subject to the conditions that no harmful interference is caused and that interference must be accepted that may be caused by the operation of an authorized radio station, by another intentional or unintentional radiator, by industrial, scientific and medical (ISM) equipment, or by an incidental radiator.

(c) The operator of the radio frequency device shall be required to cease operating the device upon notification by a Commission representative that the device is causing harmful interference. Operation shall not resume until the condition causing the harmful interference has been corrected

Title 47, CFR Section 15.13 Incidental radiators.

Manufacturers of these devices shall employ good engineering practices to minimize the risk of harmful interference.

Title 47, CFR Section 15.15 General technical requirements.

(c) Parties responsible for equipment compliance should note that the limits specified in this part will not prevent harmful interference under all circumstances. Since the operators of Part 15 devices are required to cease operation should harmful interference occur to authorized users of the radio frequency spectrum, the parties responsible for equipment compliance are encouraged to employ the minimum field strength necessary for communications, to provide greater attenuation of unwanted emissions than required by these regulations, and to advise the user as to how to resolve harmful interference problems (for example, see Sec. 15.105(b)).

The complainant has attempted unsuccessfully to work through your usual complaint resolution process and as a result the matter has been referred to our office. The FCC prefers that those responsible for the proper operation of power lines assume their responsibilities fairly. This means that your utility company should locate the source of any interference caused by its equipment and make necessary corrections within a reasonable time.

While the FCC has confidence that most utility companies are able to resolve these issues voluntarily, the FCC wants to make your office aware that this unresolved problem may be a violation of FCC rules and could result in a monetary forfeiture for each occurrence. At this stage, the FCC encourages the parties to resolve this problem without FCC intervention, but if necessary to facilitate resolution, the FCC may investigate possible rules violations and address appropriate remedies.

The American Radio Relay League, a national organization of Amateur Radio operators, may be able to offer help and guidance about radio interference that involves Amateur Radio operators.

**American Radio Relay League
Radio Frequency Interference Desk
225 Main Street
Newington, CT 06111
860-594-0200**

E-mail. rft@arrl.org

Please advise the complainant what steps your utility company is taking to correct this reported interference problem. The FCC expects that most cases can be resolved within 60 days of the time they are first reported to the utility company. If you are unable to resolve this within 60 days, please advise this office about the nature of the problem, the steps you are taking to resolve it and the estimated time in which those steps can be accomplished.

If you have any questions about this matter, please contact:

W. Riley Hollingsworth
Special Counsel
Enforcement Bureau, FCC
E-mail: rholling@fcc.gov

Thank you for your cooperation.

Sincerely,

Sharon Bowers, Deputy Chief
Consumer Inquiries & Complaint Division
Consumer & Governmental Affairs Bureau