

**Before the
Federal Communications Commission
Washington, D.C. 20554**

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

COMMENTS OF THE UNITED POWER LINE COUNCIL

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May 3, 2004

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SUMMARY

The UPLC generally supports the FCC's initiative to develop rules that will support the deployment of broadband over power line systems that will help achieve President Bush's goal of universal affordable broadband access by 2007.¹ The President supports the development of technical standards for BPL towards that goal.² Utilities and technology providers are poised to meet this ambitious goal and the UPLC appreciates the strong support of the FCC in its BPL proceedings.

The UPLC believes that the definition of Access BPL is potentially over-inclusive and should be slightly revised. The UPLC supports the proposal to retain the existing emission limits at the present time, recognizing that the FCC is proceeding cautiously, even though it has found that the interference potential from BPL is low. The UPLC also supports the proposal to require that Access BPL systems and devices incorporate capabilities that mitigate interference, provided that there is a reasonable transition period for compliance with these requirements. The UPLC is concerned that the proposal to establish a publicly accessible database for Access BPL operations unnecessarily discloses

¹ See "Bush Calls for Universal Broadband by 2007," MSNBC (March 26, 2004) at <http://www.msnbc.com/id/4609864>. (announcing that "[the U.S.] ought to have universal, affordable access for broadband technology by the year 2007, and then we ought to make sure as soon as possible thereafter, consumers have got plenty of choices when it comes to purchasing the broadband carrier."); *And see* Presidential Memorandum to the Heads of Executive Departments and Agencies (April 26, 2004) at <http://www.whitehouse.gov/news/releases/2004/04/20040426-2.html>. (reiterating that all Americans should have affordable access to broadband technology by the year 2007).

² "President Unveils Tech Initiatives for Energy, Health Care, Internet," transcript of remarks by the President at American Association of Community Colleges Annual Convention, Minneapolis,

sensitive information. Finally, the UPLC supports the measurement guidelines for Access BPL systems, and suggests improvements for them.

Minnesota (April 26, 2004), at: <http://www.whitehouse.gov/news/releases/2004/04/20040426-6.html>.

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COMMENTS OF THE UNITED POWER LINE COUNCIL

Pursuant to Section 1.415 of the Federal Communications Commission (“FCC”) Rules, the United Power Line Council (“UPLC”) hereby submits its comments in response to the Notice of Proposed Rule Making in the above referenced proceeding.³ The UPLC supports the proposal to retain the existing emission limits at this time, and suggests only slight changes to the operational limits proposed for Access BPL systems, as well as the proposed definition of Access BPL. Finally, the UPLC supports the proposed measurement guidelines, which will produce consistent and repeatable results that demonstrate compliance with the Part 15 rules. The UPLC heartily thanks the FCC for its support in developing these rules, which strike a very conservative and pragmatic

³ *Carrier Current Systems, including Broadband over Power Line Systems*, Notice of Proposed Rule Making, ET Docket No. 04-37, 2004 WL 324486 (“*BPL NPRM*”).

balance between the need to protect against interference and the need to promote the deployment of this nascent technology to help provide affordable broadband access for all Americans.

I. Introduction

The UPLC is an alliance of utilities and their technology partners that are developing BPL in America. Its mission is to drive the development of business, technical and regulatory solutions for BPL in a manner that enables all its members to succeed. The UPLC was created in recognition that significant trials are underway in various parts of North and South America. It was formed by the United Telecom Council (UTC) as a separate organization to carry on and expand on the efforts of the UTC's Power Line Telecommunications Forum (UTC PLTF) that has been the primary resource for advocacy and information on BPL in North America since 1998. Virtually every utility and technology company that is either interested in or actively deploying BPL in the U.S. is a member of the UPLC.⁴

II. Background

The record from the Notice of Inquiry⁵ reflects a significant difference between actual and theoretical BPL interference. Utilities and BPL technology partners have conducted exhaustive tests of Access BPL systems of varying sizes in various parts of the country in a variety of

⁴ The members of the UPLC are listed on the UPLC website at www.uplc.org.

⁵ *Inquiry Regarding Carrier Current Systems, including Broadband over Power Line Systems*, Notice of Inquiry, *ET Docket No. 03-104* (April 28, 2003) ("BPL NOI").

environments. These tests have been conducted in compliance with the Part 15 emission limits providing broadband connectivity to actual subscribers in real world conditions. Some of these deployments are in areas where licensees operate in the high frequency (HF) bands, and in fact, some of the subscribers are actually licensees in the HF bands themselves. In all of these deployments, there have been virtually no reported instances of interference, and any interference that has occurred has been corrected quickly and easily, using some of the mitigation techniques recommended by the FCC in this very proceeding. In short, Access BPL testing has proven that the interference potential is extremely low, and quite manageable.

The UPLC is dismayed by the misinformation accepted as gospel by opponents of Access BPL systems. Despite apocalyptic predictions that “BPL is a Pandora’s box of unprecedented proportions”, the UPLC agrees with the FCC that Access BPL devices will not cause the power lines to “act as countless miles of transmission lines all radiating RF energy along their full length.”⁶ These opponents have produced no scientific evidence to show otherwise, and all the measurements in the field contradict their abstract calculations. The industry continues to test and to address these concerns with licensees in areas where systems have been deployed, but there needs to be a rule of reason when it comes

⁶ *BPL NPRM* at ¶ 36. See also Comments of the ARRL at 2 (filed July 7, 2003).

to allegations of BPL interference, and the UPLC applauds the FCC for making that message clear in this proceeding.⁷

III. Definition of Access BPL

The proposed definition of Access BPL systems should be narrowly tailored to apply only to systems used to provide broadband access to the customer premises. As such, the UPLC recommends this slightly revised version of the FCC's language in the NPRM:

Access Broadband over power line (Access BPL): A carrier current system that transmits high frequency (>1.7 MHz) radio frequency energy by conduction over electric power lines owned, operated, or controlled by an electric service provider for the purpose of delivering broadband data services. The electric power lines may be aerial or underground, but do not include power lines within the customer premises or in riser conduit within buildings. Access BPL does not include power line carrier systems, as defined in Section 15.113 of the Commission's rules.

This revised definition would exclude narrowband power line carrier systems from the definition for Access BPL, and prevent any conflict with the rules that already apply to those systems. Similarly, there are narrowband power line automated meter reading systems that operate far below 1.7 MHz and pose no risk of interference and should be excluded from the rules for Access BPL systems, as well.⁸ Finally, the UPLC recommends that the FCC explicitly clarify that these power lines do not include power lines within the customer premises or in riser conduit within

⁷ See *BPL NPRM* at ¶ 33 (concluding that the benefits of Access BPL for bringing broadband services to the public are sufficiently important and significant as to outweigh the potential for increased harmful interference that may arise.)

⁸ For example, DCSI manufactures TWACS (two-way automated communications systems) that operate in the 50 Hz range.

buildings.⁹ These power lines are not owned or controlled by the electric utility.¹⁰ The UPLC believes that the proposed definition of Access BPL systems merely limits the types of systems and lines that are within the scope of the rules; the UPLC does not believe that it necessarily would limit it from applying to “entities that plan to own/operate Access BPL over the electric power lines but would not be electrical power providers or a subsidiary of the incumbent electric power provider.”¹¹

IV. Access BPL Emission Limits

The UPLC supports the proposal to retain the existing Part 15 radiated emission limits for Access BPL systems and devices.¹² It also supports the proposal to exempt Access BPL systems from the existing conducted emission limits of Section 15.107(c).¹³ The UPLC agrees with the FCC that the interference protections proposed are adequate to protect public safety, as well as other licensees, and does not believe that additional measures are needed.¹⁴

⁹ This would further clarify the language in the proposed definition referring to “electric power lines owned, operated or controlled by an electric service provider”.

¹⁰ See *also* Institute of Electrical and Electronic Engineers, Inc., National Electrical Safety Code 2002 Edition (2001) at § 011 (stating that the scope of the NESC covers utility facilities and functions up to the service point, and explaining that the National Electric Code, NFPA 70-1999 covers utilization wiring requirements beyond the service point).

¹¹ See *FCC NPRM* at ¶ 32.

¹² *Id.* at ¶¶ 33, 38.

¹³ *Id.* at ¶ 38.

¹⁴ *Id.* at ¶ 37.

The UPLC understands that the FCC believes that it needs to proceed cautiously by retaining the existing emission limits at this time, even though the likelihood of harmful interference is low under the current limits.¹⁵ The UPLC agrees that “the current Part 15 levels will limit the harmful interference potential of Access BPL devices to relatively short distances around these devices.”¹⁶ This has been confirmed in various BPL trials throughout the country, all of which report compliance with the Part 15 limits. After years of testing at sites that pass hundreds if not thousands of homes, the absence of any significant number of interference complaints demonstrates that the existing emission limits do adequately prevent interference from BPL to other licensed operations in the high-frequency band.

As the FCC notes, all unlicensed devices are subject to the condition that they not cause harmful interference, so even if interference did occur, the Part 15 rules would require BPL to cease operations, or otherwise mitigate the interference, as the FCC has proposed.¹⁷ Utilities and technology companies seeking to deploy Access BPL have no incentive to cause interference, thus risking stranding significant investment. It simply defies reason to presume companies would deploy these systems at all if they indeed posed such a significant risk of harmful

¹⁵ *Id.* at ¶ 33.

¹⁶ *Id.* at ¶34

¹⁷ *Id.*, citing 47 C.F.R. § 15.5(b). See also *BPL NPRM* at ¶¶ 39-42 (requiring Access BPL equipment to incorporate capabilities that adaptively mitigate interference and to shut-down).

interference, any more than makers of DVD players, CD players or other digital devices would sell products knowing there was a probability they would have to recall such products due to interference to licensed users.

In short, Part 15 has been and continues to be an effective tool for encouraging and producing non-interference to licensed services. It strikes an appropriate public interest balance between interference protection and proliferation of new technologies, products and services based upon unlicensed operations.¹⁸ Given that the Part 15 rules provide this overarching safeguard against any potential BPL interference, the UPLC encourages the FCC to revisit the existing emission limits at a later date after BPL has demonstrated, again, that those limits sufficiently protect licensees from harmful interference.

The UPLC also supports the FCC's conclusions concerning cumulative interference from Access BPL across wide geographic areas. In addition to those factors identified by the FCC,¹⁹ the UPLC also believes the Commission should consider the following factors:

- 1) Units may operate at different power levels;
- 2) Equipment may operate at different frequencies;

¹⁸ See also *BPL NPRM* at ¶ 39 (agreeing that Access BPL providers would have a strong incentive to exercise the utmost caution in installing their systems to avoid harmful interference and ensure uninterrupted service to their customers, due to their significant investment in the deployment of BPL service.)

¹⁹ See *BPL NPRM* at ¶ 36 (stating that the primary source of emissions will be the individual equipment and noting the potential for cumulative emissions is diminished by the fact that only a limited number of devices transmit simultaneously on the same frequency in the same geographic area).

- 3) Emitters can be oriented differently and polarization will be random;
- 4) Underground and overhead emitters will behave differently; and
- 5) Units on the same frequency will have different phase displacements (i.e. are not synchronized).

Any modeling of BPL cumulative emissions must account for these factors.

The UPLC does not believe that additional measures are necessary to protect public safety systems. Utilities that operate critical infrastructure communications systems (that the FCC itself considers “Public Safety Radio Services”²⁰) are very sensitive to the issue of interference both from and to their operations. Many utilities operate mission critical radio systems in the HF bands themselves. They would not jeopardize their own operations or those of public safety under any circumstances. Moreover, BPL testing has not indicated a risk of interference to public safety systems. The UPLC will continue to assess this issue, but at the present time there is no need for additional measures to protect public safety.

Finally, the UPLC supports exempting BPL from compliance with the conducted emission limits because it would pose an undue safety hazard, particularly considering that the radiated emission limits effectively

²⁰Implementation of Sections 309(j) and 337 of the Communications Act of 1934, as amended, Report and Order, WT Docket No. 99-87, 15 FCC Rcd. 22709 at ¶ 5 (2000)(concluding that utilities are included as providers of “public safety radio services” as defined in Section 309(j) of the Communications Act as amended).

prevent harmful interference already. Conducted emissions have no direct bearing on interference to radio transmissions.²¹ Therefore, the UPLC agrees with the FCC that exempting BPL from the conducted emission limits would not have any impact on interference potential.²²

V. Access BPL Operational Requirements

Consistent with its cautious approach towards BPL operations, the FCC has proposed additional technical and administrative requirements for Access BPL to further address any remaining concerns about BPL interference.²³ Although these requirements are unprecedented for any unlicensed operation, the UPLC supports these proposals, which can be reasonably achieved and which demonstrate the commitment of the industry to operate responsibly to correct interference in the unlikely event that it occurs. The UPLC requests that the FCC grandfather existing equipment and provide Access BPL providers up to two years to bring new equipment into compliance with any mitigation requirements that the FCC should choose to adopt.

Specifically, the UPLC agrees with the proposals to require BPL equipment to incorporate the capability to either adaptively mitigate interference (by frequency shifting or notching) or shut down altogether.

²¹ Comments of Current Technologies, LLC in ET Docket No. 03-104 at 16 (filed July 8, 2003). See also Comments of Enikia, LLC in ET Docket No. 03-104 at 3 (filed July 8, 2003)(stating that “possible interference potential from BPL systems is radiated, not conducted.”)

²² See *BPL NPRM* at ¶ 38.

²³ *Id.* at ¶¶ 39-43.

The UPLC also generally supports the concept of a BPL database that would notify licensees about nearby BPL operations and to facilitate interference mitigation and avoidance measures, *provided that* public disclosure of information is limited to the extent necessary to effectively resolve interference informally without providing sensitive information that could compromise critical infrastructure or competitive interests of BPL providers. In addition, the UPLC recommends that the FCC impose a reciprocal obligation of good faith on both authorized users and BPL operators to discourage frivolous complaints and to correct legitimate instances of harmful interference in a timely manner.²⁴

As the FCC notes, many of the BPL technologies already are capable of modifying system performance to mitigate or avoid harmful interference to operations in proximity with BPL operations.²⁵ UPLC asks that the FCC clarify that BPL operations are permitted to correct harmful interference by notching or shifting frequencies first, rather than requiring them to automatically shut down immediately. This clarification will facilitate interference mitigation while avoiding undue harm to customers for BPL services. Otherwise, the UPLC generally agrees with the

²⁴ The UPLC opposes comments suggesting deadlines and penalties for interference complaints. See e.g. Comments of the ARRL, National Association for Amateur Radio in ET Docket No. 04-37 at 23-24 (filed May 3, 2004) and Comments of the North American Shortwave Association in ET Docket No. 04-37 at 5 (filed May 3, 2004). There is no reason to create a new set of enforcement rules for BPL.

²⁵ *Id.* at ¶ 41, citing comments by PowerWAN, Ambient and Main.net indicating that notching specific frequencies is either technically feasible or is already possible.

frequency adjustment or shut-down capability requirements, as proposed by the FCC.

The UPLC urges the FCC to provide a reasonable period of time for BPL providers to bring their equipment into compliance with the mitigation techniques. Again, the BPL industry is nascent and the FCC should not upset reasonable investment-backed expectations by imposing the mitigation requirements retroactively to existing equipment, or too quickly on new equipment. The UPLC urges the FCC to grandfather existing equipment and believes that a two-year period would be sufficient to bring new equipment into compliance with the mitigation requirements.

Moreover, such a transition period would not alter the overriding requirement that BPL avoid causing harmful interference in general. As such, the transition period would not alter the fundamental protections of the existing Part 15 rules that are afforded authorized users in the high-frequency bands.

The UPLC is concerned about the extent of public disclosure of information on the BPL database for a number of reasons. Utilities are especially concerned about the disclosure of information that could be considered “protected critical infrastructure information” under the Homeland Security Act of 2002.²⁶ The information could be used for

²⁶ See Homeland Security Act of 2002, Pub. L. 107-296, §§211-225, Nov. 25, 2002, 116 Stat. 2135 (codified as amended at 6 U.S.C. §§101, 134 (2002)) (exempting voluntarily disclosed “critical infrastructure information” from Freedom of Information Act disclosure); See *also*, Section 1016 of the U.S. Patriot Act (codified at 42 U.S.C. § 5195(c))(creating a national policy “to ensure the stability of complex [critical infrastructure communication]

malicious purposes that might impair utility operations. Even if the information was not used for malicious purposes, disclosure of such information could waive confidentiality that would otherwise apply to critical infrastructure information in other contexts. At the same time, there are legitimate competitive concerns about disclosure of extensive information about deployments. Neither cable modem nor DSL providers are required to disclose such information, and could use information about BPL to gain an unfair competitive advantage. Finally, the database need not be complicated to be effective, and simplifying the database will minimize the administrative burden and cost of maintaining it.²⁷ Therefore, the UPLC recommends substantially limiting disclosure of the information in the database from what was proposed by the FCC.²⁸

In addition, the UPLC offers its services as the appropriate industry-operated entity to receive notifications and maintain the Access BPL database.²⁹ The UPLC has the resources and the experience from its relationship with the UTC to serve as the database administrator. UTC already maintains the database for power line carrier systems, upon which

systems . . . so as to achieve the viability and adequate protection of the critical infrastructure of the nation.”).

²⁷ UPLC opposes comments suggesting that 24/7 coverage of the database by “customer service” representatives, which would impose inordinate and unnecessary costs to effectively respond to interference complaints. See e.g. Comments of the North American Shortwave Association in ET Docket No. 04-37 at 5 (filed May 3, 2004).

²⁸ See *BPL NPRM* at ¶ 43 (proposing to disclose location, type of modulation, and the frequency bands of operation.)

²⁹ *Id.* (requesting comment on the appropriate industry operated entity that the FCC should select to receive notifications and maintain the Access BPL database).

the FCC has modeled the Access BPL database proposal. Plus, UPLC knows the industry inside and out, and is ideally positioned to collect the information for the BPL database from BPL providers.

VI. Equipment Authorization and Measurement Guidelines

All along, the UPLC has advocated equipment verification and measurement guidelines based upon *in situ* measurements at representative installations in order to promote the deployment of BPL systems.³⁰ As such, it supports the FCC's proposals to retain the Verification procedure for equipment authorization, and to demonstrate compliance with the Part 15 rules using actual measurements from three representative installations.³¹ It also supports the revised measurement guidelines for overhead lines, as well as the continued measurements at radials for underground lines. Furthermore with respect to testing each piece of equipment for compliance with the emission limits, the UPLC suggests that the FCC permit BPL operators to demonstrate compliance based upon the average emissions of the various devices as a whole, rather than focusing on each piece of equipment individually.

Verification based on *in situ* measurements is consistent with the Part 15 rules for unlicensed operations generally, and appropriate for BPL operations because they do not pose a significant risk of interference. The UPLC believes that the new guidelines for overhead lines will produce

³⁰ See Comments of the UPLC in ET Docket No. 03-104 at 14 (filed July 7, 2003).

³¹ See *BPL NPRM* at ¶ 44.

consistent and repeatable measurements that demonstrate compliance with the Part 15 rules.³² The FCC should also consider allowing BPL operators to demonstrate compliance based upon the average emissions from BPL devices in proximity to one another, instead of each individual device.³³ This will serve the underlying purpose of testing for compliance without imposing unnecessary and arbitrary burdens and costs.

VII. Conclusion

The FCC has effectively narrowed the wide range of issues from the BPL NOI into a coherent set of proposals that generally will promote the deployment of BPL without compromising on interference protection. The UPLC looks forward to working with the FCC and other stakeholders to develop rules that encourage the development of this technology, relying on real world experience rather than conjecture and abstract calculation to assess the interference potential from BPL and to develop solutions for its commercial deployment. Already, the BPL industry is beginning to roll out commercial services, and the FCC has been tremendously supportive in helping to get to this stage. Now, it is very important to stay the course of protecting authorized operations without granting them veto rights to kill BPL in the cradle. As such, the FCC must

³² The UPLC recognizes that the NTIA has suggested alternative measurement guidelines, and it defers comment on those recommendations at this time. The UPLC looks forward to working with the FCC and NTIA going forward to craft guidelines that promote BPL deployment and ensure protection against interference.

³³ *BPL NPRM* at ¶ 45.

remain cognizant of the overriding importance that BPL represents toward broadband access and competition for all Americans, and continue to reject the pet theories, hyperbole, and empty rhetoric of the opponents of BPL.

WHEREFORE, THE PREMISES CONSIDERED, the UPLC is pleased to provide these comments on the NPRM.

Respectfully submitted,

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May 3, 2004.