

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

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

To: The Commission

**JOINT COMMENTS OF
THE ASSOCIATION FOR MAXIMUM SERVICE TELEVISION, INC.
AND THE NATIONAL ASSOCIATION OF BROADCASTERS**

I. Introduction.

The National Association of Broadcasters (“NAB”) and The Association for Maximum Service Television, Inc. (“MSTV”)¹ submit these comments in response to the Commission’s *Notice of Inquiry* in this proceeding. *Notice of Inquiry* in ET Docket No. 03-104, rel. Apr. 28, 2003 (hereinafter “*Notice*”). The Commission requests information on the current state of Broadband over Power Line (“BPL”) technology. *Notice* at ¶ 1. BPL employs the same coupling of RF energy onto existing alternating current (“AC”) electrical power lines presently authorized by the Commission on an unlicensed basis

¹ NAB is a nonprofit, incorporated association which serves and represents America’s radio and television broadcast stations. MSTV is a non-profit trade association of local broadcast television stations committed to achieving and maintaining the highest technical quality for the local broadcast system.

under Part 15 of its Rules.² All Part 15 digital devices are subject to radiated emission limits and conducted emission limits while operating above 30 MHz.³ The Commission, however, has recently granted experimental licenses under 47 C.F.R. Part 5 to evaluate BPL equipment operating from 1.7 to 80 MHz.⁴ As detailed below, BPL systems operating in this range pose serious risk of interference to television channels 2-5, especially the eleven stations currently transmitting a digital broadcast signal on those channels,⁵ as well as several stations who are likely to elect lower VHF channels at the end of the digital television transition.⁶ Thus, to ensure that the public's free over-the-air television service remains clear of any interfering signals, NAB and MSTV strongly oppose any BPL operations in the television broadcast bands.

² See 47 C.F.R. §§ 15.3(f) & (t), 15.5, 15.31(d), (f), (g) & (h), 15.33(b)(2), 15.107(a)-(c), 15.109(a), (b), (e) & (g), 15.113, 15.201(a), 15.207(c), 15.209(a) and 15.221.

³ See 47 C.F.R. § 15.33(b)(1).

⁴ Ambient Corporation, File No. 0218-EX-ST-2002, Special Temporary Authority ("STA") granted December 24, 2002; Ameren Energy Communications, Inc., File No. 0093-EX-PL-2002, Experimental Authorization ("EA") granted June 5, 2002; Amperion, Inc., File No. 0046-EX-PL-2003, EA granted March 11, 2003; Current Technologies, LLC, File No. 0046-EX-ML-2002, EA granted Sept. 12, 2002; Hawaiian Electric Company, Inc., File No. 0089-EX-PL-2003, EA granted May 22, 2003; PPL Electric Utilities, File No. 0183-EX-PL-2002, EA granted Oct. 1, 2002; Progressive Energy Service Co., File No. 0011-EX-PL-2003, EA granted Feb. 10, 2003; Southern Telecom., Inc., File No. 0126-EX-PL-2002, EA granted Aug. 29, 2002.

⁵ The DTV stations currently in operation on channels 2-5 are WBBM-TV, Chicago, IL; WKYC-TV, Cleveland-Akron (Canton), OH; WHMT, Grand Rapids-Kalamazoo-Battlecreek, MI; WHP-TV, Harrisburg, Lancaster, Lebanon-York, PA; KVBC, Las Vegas, NV; WDKY-TV, Lexington, KY; WBRA-TV Roanoke-Lynchburg, VA; WTWC, Tallahassee, FL-Thomasville, GA; WMAZ-TV, Macon, GA; KOTA-TV, Rapid City, SD; and KTVM, Butte-Bozeman, MT.

⁶ See In the Matter of Advanced Television Systems and Their Impact Upon the Existing Television Broadcast Service, *Sixth Report and Order*, 12 FCC Rcd 14588 (1997) at ¶¶ 82-83 ("*Sixth Report*"); In the Matter of Second Periodic DTV Review, *Notice of Proposed Rulemaking*, MB Docket No. 03-15 (Jan. 15, 2003) at ¶ 25.

II. The Commission Must Assess BPL Technologies Realistically To Avoid Interference To Existing Services.

The Commission seeks information on the impact BPL systems would have on licensed services. *Notice* at ¶ 18. BPL technology places RF information onto existing power lines and uses complex multi carrier modulation systems which studies have shown radiate a considerable amount of interference from the power lines. Of concern to NAB and MSTV is the possibility that these systems could be allowed to operate at frequencies up to 80 MHz. *Notice* at ¶ 15. This has the potential to cause interference to TV channels 2 through 5 and has a particular potential to disrupt reception of DTV signals on those channels.⁷

All relevant studies show that the use of BPL technology causes RF energy to radiate from power lines which has the potential to interfere with licensed services. For example, based on studies done in Japan,⁸ the Ministry of Public Management, Home Affairs, Posts and Telecommunications declined to allow an increase in the frequency bandwidth of BPL systems in that country.⁹ Moreover, other studies done in Japan showed BPL systems can significantly increase the noise floor in the bands in which

⁷ Channel 2 operates on 54 – 60 MHz, channel 3 on 60 – 66 MHz, channel 4 on 66 – 72 MHz and channel 5 on 76 – 82 MHz.

⁸ Cosy Muto, Norikazu Mori, Toshiyuki Kondoh, *On Radio Interference Assessments of Access PLC System*, Presented at The 7th International Symposium on Power-Line Communications and its Applications, Kyoto, Japan, March 26-28, 2003.

⁹ *See* Announcement of Report by Power Line Communication Study Group, Japanese Ministry of Public Management, Home Affairs, Posts and Telecommunications, August 9, 2002; http://www.soumu.go.jp/joho_tsusin/eng/Releases/Telecommunications/news020809_3.html.

they operate.¹⁰ Studies performed in the Netherlands and Great Britain have come to similar conclusions, that BPL systems can cause interference to licensed services.¹¹ While these studies all evaluated systems that operate below 30 MHz, it is reasonable to presume that systems operating above 30 MHz would exhibit similar interference characteristics. Logic dictates that BPL technology that couples signals with bandwidths of up to 80 MHz on to power lines will result in RF energy being radiated from those power lines up to 80 MHz (and higher).

Similar field studies that evaluate BPL systems in the TV broadcast bands have not been performed in the United States. Ameren Energy Communications, Inc. (“AEC”) submitted a study for one of the periodic reports required as a condition of their experimental authorization that includes measurements up to 300 MHz.¹² However, the study evaluated operations between 2-20 MHz and hence provides no useful information about wider bandwidth BPL systems’ impact on the TV broadcast bands.

¹⁰ See, e.g., Fuminori Tsuchiya, Hiroaki Misawa, Tomoyuki Nakajo, Ichiro Tomizawa, Junichi Nakajima, Masatoshi Ohishi, Munetoshi Tokumaru, Takayuki Ono, and Akira Morioka *Interference Measurements in HF and UHF Bands Caused by Extension of Power Line Communication Bandwidth for Astronomical Purpose*, presented at The 7th International Symposium on Power-Line Communications and its Applications, Kyoto, Japan, March 26-28, 2003.

¹¹ Netherlands: Koos Fockens, *The radio amateur and the effects of the use of the 230 Volt power line for broadband data communication (PLC)*, Report of VERON EMC Committee, March 2002; Great Britain: *Compatibility of VDSL & PLT with Radio Services In The Range 1.6 MHz To 30 MHz*, Final Report of the Technical Working Group, British Radiocommunications Agency, Department of Trade and Industry, Oct. 2002.

¹² *Second Report pursuant to the terms of Experimental License, WC2XXK*, File No. 0093-EX-PL-2002, Ameren Energy Communications, Inc., filed June 4, 2003 (“AEC Report”).

Other BPL experimental licensees have made only passing references to “no reports of interference” but have not supplied measurement data to support those assertions.¹³ A lack of consumer complaints is woefully inadequate evidence upon which to base any conclusion that BPL does not cause interference. It is uncommon for a viewer to complain to the FCC or the broadcaster when interference occurs. Faced with a poor broadcast signal or no signal at all, a viewer is likely to respond only by switching the television channel.¹⁴ Further, it is highly unlikely that television viewers would even *be aware* that the entity holding an experimental authorization caused interference to their television receiver. Assuming, *arguendo*, that a consumer could identify the source of interference and lodged a complaint to the broadcast licensee; the broadcaster could not modify the consumer’s television receiver to address the interference problem.¹⁵ Instead, the broadcaster would have to rely on a lengthy process at the Commission level to (1) determine and confirm the source of interference and (2) require the BPL entity to correct the interference. Simply stated, a low number of consumer complaints does not equate

¹³ See, e.g., In the Matter of Joint Report of the Power Line Communications Association and the United PowerLine Council regarding the State of the Power Line Communications, Industry, *Joint Report*, March 3, 2003 at 8 (in which The Association states “[n]one of these field trials have caused any interference to home entertainment equipment, licensed wireless services or other spectrum users,” but does not present any data to support such claims).

¹⁴ See Comments of MSTV, NAB and the Association of Public Service Television Stations (“APTS”) in the Matter of Additional Spectrum for Unlicensed Devices Below 900 MHz and in the 3 GHz band, ET Docket No. 02-380, April 17, 2003 at 13-14 (“*MSTV/NAB/APTS Unlicensed Devices Comments*”).

¹⁵ At present, the TV sets in the market include at least 267 million analog sets (whose performance characteristics are, for the most part not regulated and not known by the Commission) and evolving generations of digital sets. Consumers have paid for those sets, which were manufactured pursuant to design specifications that did not contemplate shielding the sets from BPL transmissions, and should not be forced to replace them to avoid interference from secondary users in the broadcast bands.

to a sound technical record, nor does a complaint trigger an expeditious remedy by the interfering entity. Rather, BPL technology must be subjected to the rigorous testing needed to determine whether it is effective in *preventing* interference in real-world settings – especially a setting as complex and subject to change as the TV broadcast band as it transitions to DTV.

III. The Commission Must Not Allow BPL Technologies to Derail the DTV Transition.

There are eleven DTV stations currently operating on channel 2 through 5. As the Commission itself has recognized, the lower VHF channels “are subject to a number of technical penalties, including higher ambient noise levels due to *leaky powerlines*, vehicle ignition systems, and other impulse noise sources”¹⁶ The lower VHF bands, therefore, are already heavily polluted with man-made impulse type background interference.

Existing BPL studies reveal that the multi carrier modulation techniques employed by BPL systems have a spectral profile that resembles impulse noise.¹⁷ Studies on file with the Commission have shown that DTV reception is severely impaired by impulse noise in the low VHF band.¹⁸ They revealed that the interleaver in DTV receivers reacts badly to impulse noise resulting in the inability of the TV set to produce a picture. Further, the study by F. Tsuchiya, *et al.* concluded that BPL systems could

¹⁶ *Sixth Report* at ¶ 82 (emphasis added).

¹⁷ *See, e.g.,* F. Tsuchiya, *et al.* at Figure 2 and AEC Report at Figure 7.

¹⁸ *See* VSB/COFDM project, *VSB/COFDM Comparison Report*, December 2000; Advisory Committee on Advanced Television, *Terrestrial Broadcast Field Tests*, October 1995.

significantly raise the noise floor.¹⁹ Such an increase could adversely affect both analog and digital receivers. The disruption of the viewing experience, however, would be more significant in the DTV context, where interference would result in a loss of picture (rather than a snowy picture as in the analog environment).

Congress has expressed its disapproval for regulatory changes that would permit such service degradation. *See* Auction Reform Act of 2002, Pub. Law No. 107-195, 116 Stat. 716. Anticipating efforts to clear channels 52-69 for new service (by permitting broadcasters occupying those channels to use in-core digital allotments for analog transmission), Congress forbade waivers of spacing or interference rules that would result in “*any* degradation in or loss of service, or an increased level of interference, to *any* television household except as the Commission’s rules would otherwise expressly permit.” *Id.* at § 6(a) (emphasis added). Were the Commission to approve BPL in the lower VHF band, it would violate Congressional policy requiring the Commission to maintain an interference-free DTV service during the transition.

Allowing BPL to operations in the low VHF band is likely to severely exacerbate an already existing interference problem and could upset the Commission’s own policy of allowing broadcasters to choose to move their DTV station to their current NTSC channel at the time of the so-called “Spectrum Re-packing.”²⁰ Further, a “critical mass” of consumers is needed to adopt DTV in order for the transition to gain its much-anticipated

¹⁹ *See, e.g.,* F. Tsuchiya, *et al.* at Note 10.

²⁰ *Sixth Report* at ¶¶ 82-83.

momentum.²¹ Faced with an interference-riddled environment, viewers may be reluctant, even unwilling, to invest in DTV receivers. When faced with a complete loss of picture, viewers may simply choose to seek programming from another medium.

IV. Conclusion.

For the reasons stated above, while NAB and MSTV do not oppose BPL as a technology per se, there is insufficient technical data upon which the broadcast industry and the Commission can fully and properly evaluate BPL's potential to interfere with free-over-the-air broadcast television stations operating on the low VHF frequencies, including DTV signals. The low VHF TV band is already heavily polluted with man-made impulse type background interference, attributed in part to leaky power lines. BPL systems radiating RF energy in the television broadcast bands are likely to lead to a further increase of the noise floor and may result in significant analog television picture

²¹ See, e.g., John Haring and Jeffrey Rohlf, Strategic Policy Research, *Permitting Unlicensed Devices on Broadcast Spectrum During the DTV Transition: Substantial Costs and Risks, Largely Speculative Benefits* at 14-15 (April 2003), attached to *MSTV/NAB/APTS Unlicensed Devices Comments*.

disruption and total degradation of DTV signals. Thus, we strongly urge the Commission not to authorize BPL in the television broadcast bands.

Respectfully submitted,

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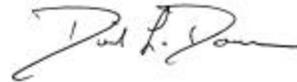
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