

**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
	)	
Amendment of Part 15 regarding New Requirements and Measurement Guidelines for Access Broadband over Power Lines	)	ET Docket No. 04-37
	)	

**REPLY OF  
THE ASSOCIATION FOR MAXIMUM SERVICE TELEVISION, INC. TO  
OPPOSITIONS TO PETITION FOR RECONSIDERATION**

The Association for Maximum Service Television, Inc. (MSTV) submits this reply to the Oppositions of CURRENT Technologies, LLC (CURRENT) and the United Power Line Council (UPLC)<sup>1</sup> to MSTV's Petition for Reconsideration (MSTV Petition)<sup>2</sup> of the *Report and Order (BPL Order)* in this proceeding.<sup>3</sup> The MSTV Petition cited ample evidence – including a new television interference study entitled to consideration at this stage in the proceeding – demonstrating that the deployment of Access Broadband over Power Line (Access BPL or BPL) technologies in the low VHF band (50 to 80 MHz) poses a significant risk of

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<sup>1</sup> Opposition of CURRENT Technologies, Inc. to Petitions for Reconsideration, ET Docket No. 03-104 (Mar. 23, 2005) (CURRENT Opposition); Opposition of the United Power Line Council to Petitions for Reconsideration, ET Docket No. 03-104 (Mar. 23, 2005) (UPLC Opposition).

<sup>2</sup> Petition for Reconsideration of the Association for Maximum Service Television, Inc., ET Docket No. 03-104 (Feb. 7, 2005) (MSTV Reconsideration Petition).

<sup>3</sup> Report and Order, *Carrier Current Systems, including Broadband over Power Line Systems; Amendment of Part 15 regarding new requirements and measurement guidelines for Access Broadband over Power Line Systems*, ET Docket Nos. 03-104, 04-37, 19 FCC Rcd. 21,265 (Oct. 28, 2004) (*BPL Order*).

The Oppositions were filed on March 23, 2005. Although a reply to an opposition to a petition for reconsideration typically is due 10 days after the due date for filing oppositions, 47 C.F.R. § 1.429(g), here the Oppositions were required to be served on MSTV, 47 C.F.R. § 1.429(f), and were in fact served by mail. Accordingly, MSTV was entitled to an additional three (3) days for filing its response. 47 C.F.R. § 1.4(h).

interference to reception of licensed television broadcast services. The potential for interference is enough to create a meaningful threat to the success of the Commission's own digital television (DTV) initiative. Accordingly, the Commission should reconsider the *BPL Order* and temporarily defer any BPL operations in the low VHF band until the end of the DTV transition.

### **ARGUMENT**

#### **I. THE *BPL-TELEVISION STUDY* MAY PROPERLY BE CONSIDERED BY THE COMMISSION ON RECONSIDERATION**

The study submitted with the MSTV Petition (*BPL-Television Study*)<sup>4</sup> is entitled to consideration by the Commission at this stage in the proceeding. As noted in the UPLC Opposition, new facts presented in a petition for reconsideration will be considered by the Commission where (1) the facts relate to events which have occurred since the last opportunity to present them to the Commission, (2) the facts were unknown to the petitioner until after its last opportunity to present them and could not have been learned through due diligence; or (3) the Commission determines that consideration of the facts is required in the public interest.<sup>5</sup> The *BPL-Television Study* here should be considered because the study could not have been conducted earlier in the proceeding and because the public interest requires that it be considered.

MSTV noted during the comment stage that very little information was available about the operating parameters of BPL systems.<sup>6</sup> No experimental BPL system was operating in the low VHF band (above 50 MHz), and no BPL proponent submitted information describing the

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<sup>4</sup> M. Winston Caldwell & R. Evans Wetmore, Fox Technology Group, *Interference Effects into Low VHF Television Arising From Broadband Over Power Line* (Feb. 3, 2005) (*BPL-Television Study*). This study was conducted by two registered professional engineers, with nearly 45 years combined experience in the industry, using appropriate analytic techniques and based on the best information available at the time.

<sup>5</sup> 47 C.F.R. § 1.429(b); *see also* UPLC Opposition at 4 n.8.

<sup>6</sup> *See* Joint Comments of the Association for Maximum Service Television, Inc. and the National Association of Broadcasters, ET Docket No. 03-104, at 5 (July 7, 2003) (MSTV/NAB NOI Comments); Joint Reply Comments of the Association for Maximum Television, Inc. and the National Association of Broadcasters, ET Docket No. 03-104, at 3 (Aug. 20, 2003).

technology that BPL systems operating above 50 MHz might employ. In the absence of such information, it was virtually impossible for MSTV to conduct a reliable study of the precise interference effects to television that could result from such operations. Nonetheless, MSTV cited important data from other countries showing the potential for interference from BPL to television reception.<sup>7</sup>

It was only after the Commission adopted the *BPL Order* specifying the Part 15 limits that would apply to Access BPL systems that MSTV had some concrete information upon which to base an interference analysis. Even the Part 15 limits provide only a very general sense of the type of radiating interference that might be expected from an Access BPL system, and BPL system operators remain unwilling to disclose the exact operating parameters of their systems. Nonetheless, MSTV and its consultants used due diligence to conduct the *BPL-Television Study* as quickly as possible, in accordance with the technical parameters authorized in the *BPL Order* and analyzing a range of possible modulation techniques and power levels. It was not possible to conduct such a study earlier in the proceedings.

In addition, the public interest requires that the Commission take into account the results of the *BPL-Television Study* in reconsidering the *BPL Order*. The *BPL-Television Study* is the first study of its kind – either in the United States or abroad – that specifically analyzes the effects of Access BPL on broadcast television. Given the study's conclusions about the potential risk of interference and the resulting threat to the DTV transition, the public interest demands that the Commission fully consider the study's findings before affirming the authorization of Access BPL systems in the low VHF band.

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<sup>7</sup> See MSTV/NAB NOI Comments at 3-4.

## II. THE *BPL-TELEVISION STUDY* DEMONSTRATES A SUBSTANTIAL RISK OF HARMFUL INTERFERENCE TO TELEVISION OPERATIONS

The CURRENT Opposition contends that an error in the *BPL-Television Study* resulted in its overstating the interference potential of BPL to broadcast television.<sup>8</sup> But CURRENT's technical analysis fails to recognize that a variety of scenarios were considered in the *BPL-Technical Study*, based, by necessity, on various assumptions that may or may not apply to different Access BPL systems. The fact that one assumed power level and measurement technique may not apply to CURRENT's Access BPL system (or other systems) does not detract from the study's overall findings that harmful interference to television reception is likely from BPL systems operating at a variety of power levels and using a variety of modulation techniques. The fundamental conclusion of the study – that BPL operations in the low VHF band have “the real capability of making television reception impossible”<sup>9</sup> in some circumstances – remains valid.

The CURRENT Opposition asserts that the *BPL-Television Study* is unreliable because: (1) the model was not validated through comparison to actual field strength measurements, and (2) BPL signal power was incorrectly measured across the entire 6 MHz television bandwidth rather than using a 120 kHz measurement bandwidth.<sup>10</sup> As described in the attached Technical Response, neither of these assertions undermines the essential validity of the study's conclusion.

First, the study was forced to rely on modeling and assumptions because BPL technology developers were unwilling to provide detailed information about the technical

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<sup>8</sup> See CURRENT Opposition at 14 & Technical Appendix.

<sup>9</sup> *BPL-Television Study*, at 39.

<sup>10</sup> See CURRENT Opposition, Technical Appendix at 1 & n.6 (*citing* 47 C.F.R. § 15.35(a) as specifying reliance on CISPR 16 compliant measurement equipment using a 120 kHz measurement bandwidth).

parameters of their deployed systems that would have allowed MSTV to conduct a more “real world” assessment of the actual power radiated from an Access BPL system operating above 50 MHz and the potential interference from such a system to low VHF television reception.

Second, CURRENT provides no evidence to support its claim that the *BPL-Television Study*'s approach to measuring power level and potential interference was inappropriate for the purpose of the *Study*. Although Section 15.35(a) of the Commission's Rules refers to CISPR Publication 16 for guidance concerning how to measure compliance with Part 15 standards generally, nothing in the *BPL Order* or the record of this proceeding specifically requires reliance on CISPR 16 in evaluating the potential interference from BPL systems to licensed services. Moreover, the measurement guidelines specifically applicable to Access BPL systems do not provide any guidance concerning how a CISPR 16 compliant device would be operated to measure BPL power levels for purposes of evaluating the potential interference to TV reception.<sup>11</sup> Evaluating the potential BPL power level across the entire bandwidth of a TV channel is appropriate where the goal of the measurement is to determine what BPL interference levels will affect reception of TV transmissions (*i.e.*, 6 MHz bandwidth).

Third, the scenario CURRENT claims is inapplicable to its systems is only one of a number of scenarios evaluated in the *BPL-Television Study*. Even if the determination of interference with respect to a single scenario were somewhat overstated, the other conclusions of the study – showing interference to TV reception under a variety of scenarios – have not been questioned. For example, the *BPL-Television Study* showed that Part 15 compliant BPL systems can cause interference to television reception even when the power per unit bandwidth interference is changed. See attached Technical Response.

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<sup>11</sup> *BPL Order*, at Appendix C. Indeed, the guidelines reference an ANSI standard for reporting radiated emissions, further clouding the question of what methodology should be used to measure BPL power levels. *Id.*

The Oppositions' critiques of the models employed by the *BPL-Television Study* do not undermine the *Study*'s central conclusion that Access BPL poses a significant risk of interference to low VHF television stations. Although some degree of uncertainty is inherent – both because of the lack of system operating parameters made available by BPL providers and because of the Commission's oblique guidelines concerning compliance measurement criteria – the *BPL-Television Study*, particularly when taken together with other information already in the record in this proceeding, should cause the Commission considerable concern about the problems that may lie ahead if Access BPL services are allowed to deploy in the low VHF band.

### **III. THE RELIEF MSTV SEEKS IS ONLY TEMPORARY AND WILL NOT IMPAIR ACCESS BPL DEPLOYMENT IN THE NEAR TERM**

UPLC asserts generally that “restricting BPL operations in other bands and areas will impair BPL performance and discourage its deployment.”<sup>12</sup> In particular, UPLC states that “restricting BPL from operating above 50 MHz as [MSTV] suggests would eliminate even more bandwidth for BPL operations.”<sup>13</sup> But, as noted in the MSTV Petition, no currently deployed Access BPL systems operate above 50 MHz, and none of the BPL proponents advocated operating above 50 MHz.<sup>14</sup> Nor did the record demonstrate a need for BPL operations above 50 MHz.<sup>15</sup>

In light of the interference concerns described above, an appropriate balancing of the interests in this proceeding requires the Commission to delay deployment of Access BPL services in the low VHF band until the end of the DTV transition when BPL technology is more advanced and the risk to DTV operations can be evaluated more thoroughly. This will produce

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<sup>12</sup> UPLC Opposition at 5.

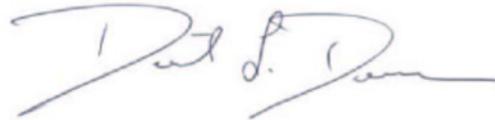
<sup>13</sup> *Id.* at 5 n.9.

<sup>14</sup> *See* MSTV Reconsideration Petition at 11.

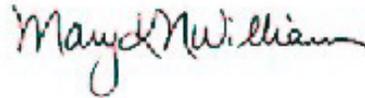
<sup>15</sup> *See id.*

the best outcome for all parties involved, including the potential consumers of both DTV and BPL services, because interference will be avoided during this sensitive DTV transition period at the same time that deployment of new BPL technologies is able to occur.

Respectfully submitted,



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April 6, 2005

## Technical Response

CURRENT's Technical Appendix asserts that the *BPL-Television Study* (the *Study*) commissioned by MSTV overstates the potential interference of BPL signals to television reception. The CURRENT assertions misapprehend several aspects of the *Study* and do not undermine the *Study's* overall validity.

### Modeling and assumptions

CURRENT asserts that the *Study* relies on computer models with unspecified parameters as to the BPL stimulus signal that are not validated against empirical measurements. But CURRENT ignores the *Study's* explanation that reliance on models and assumptions was necessitated by the lack of detailed specifications and documentation provided by BPL proponents about the parameters and operations of their systems. In the face of the BPL industry's unwillingness to provide detailed technical information, the *Study* employed recognized and reliable modeling techniques and examined a number of scenarios based on the available information about the alternatives being developed and deployed by BPL developers.

The modeling technique used, Version 4 of the Numerical Electromagnetic Computation (NEC4) was developed for use by the U.S. government at the highly respected Lawrence Livermore National Laboratory. This modeling technique is widely used by antenna designers nationwide and is considered very reliable.

In addition, the *Study* modeled different types of modulation, including OFDM and DSSS, in order to examine the potential interference effects of the range of BPL systems currently being developed. The *Study* made clear that the results varied depending on which modulation is used, but that most scenarios explored showed the potential for significant interference to television reception.

### Measurement approaches

CURRENT also claims that the *Study* incorrectly measured BPL signal power across the entire 6 MHz television bandwidth rather than using a 120 kHz measurement bandwidth. But evaluating the potential BPL power level across the entire bandwidth of a television channel is appropriate where the goal of measurement is to determine what undesired noise would affect television reception.

The *Study's* methodology is appropriate for the purposes served by the *Study*. For example, because the potential interference to television reception needed to be evaluated across the TV channel, the *Study* used a 1 hertz bandwidth which can be corrected for any other measurement bandwidth. The Commission's guidelines for measuring BPL system compliance with the Part 15 requirements do not expressly require the same measurement techniques for evaluating potential interference to other systems. Moreover, the guidelines do not clearly prescribe how a CISPR Publication 16 compliant device should be operated to measure BPL power levels for purposes of evaluating the potential interference to television reception. Indeed, the guidelines also reference an ANSI standard, further clouding the question of what methodology should be used to measure BPL power levels.

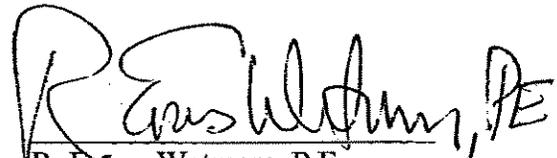
Additionally, the data in the *Study* show that even if a 120 kHz measurement bandwidth were used, BPL systems would still cause harmful interference to television reception. The D/U tables in the *Study* show that with an aggregation of 17.8 dB there is interference. Even where the aggregating number is changed to 17.0 dB (from  $10 \log (6 \text{ MHz}/120 \text{ kHz})$ ), interference still results.

Also, given the extremely high interference levels that the BPL signal encounters on a real power line, it is highly unlikely that BPL systems can operate successfully at very low power levels. CURRENT implies that its operating levels are very low, but it does not provide any specific information concerning its power levels.

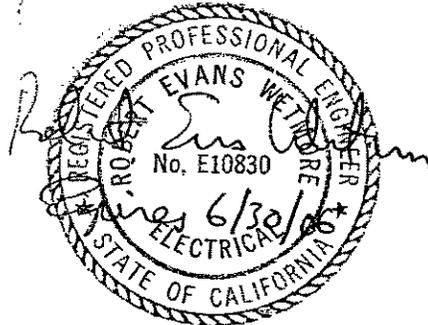
#### Study validity

The *Study* shows that, under a number of different scenarios, Part 15-compliant BPL systems are likely to cause interference to television reception. Changing the power per unit bandwidth does not eliminate the interference threat. Although the exact amount of interference can only be ascertained when the exact nature of the BPL signal, including modulation type and power level, is known, the *Study*'s fundamental conclusion that BPL systems currently being developed and deployed pose a significant threat of interference to television reception is not undermined by the minor technical criticisms contained in the CURRENT Technical Appendix.

April 6, 2005



R. Evans Wetmore, P.E.  
Fox Technology Group

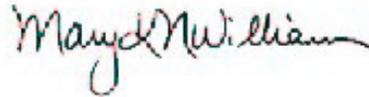


**CERTIFICATE OF SERVICE**

I, Mary Newcomer Williams, hereby certify that on this 6th day of April, 2005, a copy of the foregoing Reply of the Association for Maximum Service Television, Inc. to Oppositions to Petition for Reconsideration was served via electronic mail on:

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