Comments from Enikia LLC

Enikia® LLC would like to submit the following comments in response to the Notice of Inquiry (NOI) regarding Carrier Current Systems, including Broadband over Power Line systems.

RESPONSES TO QUESTIONS RAISED IN NOTICE OF INQUIRY

With reference to questions raised under subsection 15 of NOI:

The frequency range of 1.7 to 80 MHz would appear to be a reasonably wide enough spectrum for Access BPL. More specifically, we believe that Access BPL will likely operate in the frequency range of 1 to 30 MHz. We are aware of at least one attempt made in the past to create an FDM spectrum management mechanism to accommodate Access BPL and In-house BPL operating in the same area. It is apparent to us that standardization efforts that would include allowances for Access BPL and In-house BPL co-existence would be very beneficial. We believe Access BPL can achieve throughput rates of 50 – 100 Mbps or higher. It is likely that initially this bandwidth will be distributed asymmetrically to support Internet access and similar types of applications, with dynamic bandwidth allocation becoming a dominant approach later. It is our understanding that Orthogonal Frequency Division Multiplexing (“OFDM”) is the most used modulation method for both Access BPL and In-house BPL systems. For In-house BPL systems based on the HomePlug® Powerline Alliance version 1.0 standard, each packet is encrypted with DES encryption at the physical layer to ensure security between neighboring networks. For HomePlug-based systems, the powerline medium is shared among devices by a carrier sense multiple access (CSMA) technique with extensions to avoid channel collisions. At this point, any contention resolution schemes between Access BPL and In-house BPL systems are proprietary. Standardization among BPL systems should resolve this. In some applications, it is conceivable for Access BPL products to work together with In-house BPL products.

With reference to questions raised under subsection 17 of NOI:

We believe systems based on the HomePlug 1.0 specification are the primary source for In-house BPL products domestically and internationally. HomePlug 1.0 based devices can transmit data at up to 14 Mbps between outlets, with application level throughput exceeding 5 Mbps in over 80% of outlet pairs. The HomePlug alliance, which was co-founded by Enikia, has also begun the process of developing a next-generation standard, dubbed HomePlug AV. HomePlug AV is targeting a throughput rate of over 50 Mbps. Orthogonal Frequency Division Multiplexing (“OFDM”) is the modulation method used for Homeplug based In-house BPL systems. Each packet is encrypted with DES encryption at the physical layer to ensure security between neighboring networks, and the powerline medium is shared among devices by a carrier sense multiple access (CSMA) technique with extensions to avoid channel collisions.

With reference to questions raised under subsection 20 of NOI:

It is our understanding that both Access and In-house BPL systems use both low-pass and High-pass filtering to avoid transmission or reception of frequencies outside of their band of interest. We do not believe Access or In-house BPL systems assume any interference mitigation from the low-voltage transformer. We believe there may be a need to define a set of frequency bands that BPL systems need to avoid in order to protect licensed users, for example amateur radio users. However, we believe that Access BPL system providers

will likely take the same approach as the HomePlug alliance, and avoid transmission at these frequencies. We have found no interference between BPL and DSL or cable modem services. Our testing, as well as substantial testing by members of the Homplug alliance and Access BPL providers, has shown no significant harmful interference. We believe existing Part 15 rules are adequate for Access and In-house BPL, and that no tailoring should be necessary. We believe that possible interference potential from BPL systems is primarily radiated, and not conducted. Therefore we believe the radiated limits should be kept.

With reference to questions raised under subsection 23 of NOI:

We believe it is possible to create unified test loops, similar to what has been done in the past in the telephony arena. With sufficient test data, it should be possible to create a representative subset of network response characteristic types, and implement them as test loops. This should decrease the testing burden and promote consistency and repeatability. With regards to measurement procedures, it may not be necessary to adopt the same measurement methods for Access BPL and in-house BPL. It is likely that these systems will operate in different environments, and it may be advantageous to have different measurement methods. This would allow for easier testing based on location and surroundings, and also allow for the possibility of some leeway on Access BPL emission compliance. We are not convinced that conducted measurement methods, in their current form, are the best methods to use. A model needs to be developed that is accurate in the frequency band of interest and accurately reflects the unbalanced nature of the network. Test loops for radiated measurements may be a better approach. With regards to the method or mode of signal injection, the testing completed to date does not seem to show a substantial difference in radiated emissions based on the mode of connection. Perhaps more data is needed to confirm this. It is our understanding and belief that In-house and Access BPL systems use the existing wiring as a wired network, and can be characterized based on test data. Test loops could then be constructed in a laboratory or open area test site.

With reference to questions raised under subsection 26 of NOI:

We do not believe Access and In-house BPL systems should pose a higher risk if the devices are in compliance with current radiation limits. We believe equipment authorization should be related to active couplers, passive couplers and modems. The current authorization procedure used by In-House BPL systems of Verification, or the Declaration of Conformity procedure, would be appropriate and sufficient, in our opinion.

GENERAL COMMENTS

BPL technology is an exciting new way of utilizing existing networks and infrastructure to provide products and services to homes and businesses. It would appear to be the next great wave of technological evolution. The Commission has successfully used Part 15 of its rules in the past to foster new innovations that can benefit the consumer in many ways, while still preventing interference between unlicensed devices and licensed services. We believe that to date there has been no significant reason shown for any major change in rulemaking related to governing Access and In-House BPL devices. We believe further progress and innovation of this technology will proceed quickly with clarity of emission requirements and certainty of compliance rules.

Submitted on behalf of Enikia LLC by,

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