

March 9, 2006

**VIA FEDERAL EXPRESS**

Jaclyn A. Brillling  
Secretary  
New York State Public Service Commission  
Three Empire Plaza  
Albany, New York 12223-1350

**Re: Proceeding on Motion of the Commission to Examine Issues Related  
to the Deployment of Broadband over Power Line Technologies --  
Case 06-M-0043**

Dear Madam Secretary:

Transmitted herewith on behalf of Microwave Satellite Technologies, Inc. is an original and fifteen copies of its Comments in the above-reference matter. Also attached is an additional copy of this notification. Please date stamp the file copy and return it in the attached self-addressed stamped envelope.

Should any questions arise in connection with this matter, kindly contact the undersigned.

Respectfully submitted,

  
Howard J. Barr

Enclosure

**Before the  
State of New York  
Public Service Commission**

Proceeding on Motion of the Commission                    )  
to Examine Issues Related to the Deployment            )  
of Broadband over Power Line Technologies            )        Case 06-M-0043

To: The Commission

**COMMENTS OF MICROWAVE SATELLITE TECHNOLOGIES, INC.**

Microwave Satellite Technologies, Inc. ("MST") by counsel, respectfully submits its comments in response to the Public Service Commission's ("PSC") request for comments on the regulatory issues posed by broadband over powerline ("BPL") services.<sup>1</sup> The following is submitted:

**Introduction**

Today, the need for rapid and convenient access to information has never been more critical. Business and residential customers expect and demand high-speed Internet access and data communication capabilities. Likewise, the deployment of broadband delivery capabilities to provide all Americans with access to affordable high speed Internet and data services is one of the most important challenges currently facing the communications industry. BPL has the significant potential to satisfy consumer demand and to make broadband available and affordable to all.

In-Building (infra), because it utilizes in-building electric wiring, has numerous other consumer friendly applications.<sup>2</sup> Homes with multiple PCs, Internet devices, and smart appliances

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<sup>1</sup> BPL is a form of "power line communications" or PLC. Many people use the terms PLC and BPL interchangeably.  
<sup>2</sup> Given the MDU environment within which MST operates, it will refer to InHouse BPL as "In-Building BPL".

need a way to connect throughout the whole house. In-Building BPL can be the high-speed backbone of affordable home networking solutions. Applications include the ability to remotely control HVAC and home air quality; remote monitoring of security cameras, elevator shaft monitoring and maintenance and numerous other applications. MST has presently installed In-Building BPL in a number of MDUs in Manhattan with numerous additional installations planned and/or in the works. MST currently provides voice and broadband internet services over its In-Building BPL network with video applications on the way.

**Technology**

MST is a leading private cable operator (“PCO”) serving the New York Metropolitan Area for almost 25 years. As a PCO, its service offerings include, among other things, traditional cable television programming services, voice over IP telephony (VOIP), high speed internet access, and wi-fi service to multi-dwelling unit properties (MDUs) under its trade name NuVisions Broadband Services™. MST, in association with its corporate parent, Telkonet, Inc., is on the leading edge in the provision of In-Building, a service separate and apart from Access BPL which is at the heart of the Commission’s request for comments.

As the Commission’s request for comments notes, Access BPL systems deliver high speed Internet and other broadband services to homes and businesses using the Medium Voltage (“MV”) distribution grid. Access BPL is an end-to-end solution with a focus on residential users. From Telkonet’s perspective, the R&D investment required to achieve safe, reliable long distance transmission on the MV line is very high. Furthermore this investment is difficult to recover when amortized over the number of end users when the initial take rate is usually very low.

The Telkonet In-Building solution (known as the iWire System™) is a robust system, scalable to hundreds of users, intended for large installations, such as commercial properties, hotels, apartment complexes and government markets, that demand a high degree of reliability and service management features. Utilizing the Telkonet solution, MST is able to provide high-speed Internet and data services by coupling RF energy onto the electrical wiring -- that is not owned, operated or controlled by an electric service provider -- existing inside a building.<sup>3</sup> The Telkonet iWire System™ uses proven, patented PLC technology to transform a building's internal electrical wiring into an intelligent broadband networking platform.

Each A/C outlet becomes a LAN drop, allowing Ethernet-enabled devices such as PCs, VoIP phones, and servers connect to the network. In other words, the Telkonet system converts every power outlet in every room to a high-speed data network connection. Applications supported by the Telkonet platform include but are not limited to: VoIP telephony, Internet connectivity, local area networking, video conferencing, closed circuit security surveillance and a host of other information services.

Anywhere you have an ordinary electric wall outlet, the Telkonet solution offers Internet and data access. Telkonet's PLC solutions are quick to deploy, easy to use, reliable, secure and offer a competitive alternative to digital subscriber line (DSL), cable modem services and other high speed Internet access technologies. Since it uses a facility's existing electrical wiring as the data transmission medium, the upfront capital expenditures associated with installing copper or fiber is not a consideration. Most installations are completed in a few hours to a few days, and the size and amount of equipment required for installation is minimal. Further, since no new

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<sup>3</sup> The signal is introduced onto the building electrical line through either electromagnetic (inductive) or electrostatic (capacitive) coupling, usually at a power distribution panel.

wiring is needed, the disruption to day-to-day operations involved in wired installations are largely avoided with an In-House PLC deployment.

Telkonet's product line consists of a suite of components which are configured to deliver high speed data communications signals (including the Internet) across existing electric wiring in commercial and residential buildings and residences, as follows:

- **Telkonet Gateway (Generation 3 Platform currently in production)**

The Gateway is a modular, self-contained, fully manageable virtual network switch. The gateway receives data on a 10/100 Ethernet port and converts it to powerline carrier (PLC) format for distribution to one or more Telkonet Couplers. Each Gateway can support up to 1024 iBridges™ and 4096 Ethernet endpoints.

- **Telkonet eXtender™**

An eXtender™ is a secondary Gateway used as a repeater to increase network scalability by reproducing the PLC signal thereby supporting additional iBridges™.

- **Telkonet Coupler**

A passive device that is connected to an electrical panel (single or three-phase) in a facility via either a fuse disconnect or a multi-pole circuit breaker. The Coupler accepts PLC signal from the Telkonet Gateway or eXtender via coaxial cable and allows PLC to pass across the grid. A licensed electrician is required to install the coupler

- **Telkonet iBridge™**

An intelligent, single-port Ethernet to PLC device converting an AC outlet to a LAN drop. Each Telkonet iBridge™ communicates with the Telkonet Gateway and/or Telkonet eXtender™ using an AES 256-bit encrypted data stream, providing security on par or better than many wired networks.

In general, the Telkonet Gateway or Telkonet eXtender™ converts an Ethernet signal into a PLC communication format and injects that into the electrical infrastructure of the building.

The Telkonet iBridge™ recovers the PLC signal and converts it back into standard Ethernet format for use in end-user devices.

Although many PLC solutions provide transmission speeds only realistically suitable for the home market (< 1 Mbps), Telkonet's iWire System™ meets the higher throughput requirements needed for larger implementations. Telkonet's current technology offers throughput of up to 14Mbps, adequate to support transmission of data, voice, and video in small- to medium-sized deployments. Future improvements to the scalability and performance of the Telkonet iWire System™ are planned, including the release of components that will enable data transmissions at speeds of 85 to 200 Mbps while improving noise level tolerance and overall signal reach.

Most PLC LANs are based on the HomePlug 1.0 standard, which uses orthogonal frequency division multiplexing (OFDM) as the basic data transmission technique. Telkonet's platform likewise employs OFDM techniques.

OFDM manages and mitigates the amount of disturbance present at any given time in the power lines, which is critical to ensuring the integrity of the data transmission. OFDM counters sources of interference, such as fluorescent and halogen lamps, switching power supplies, dimmer switches, and amateur band radio transmitters, which can cause significant bit errors in data transmissions.

When a noise source presents itself, Telkonet's PLC system, using orthogonal frequency division multiplexing (OFDM),<sup>4</sup> alternates between the frequency bands affected and continues to operate at a slightly reduced speed. Telkonet's PLC chipset solution occupies the band from

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<sup>4</sup> OFDM is the transmission technique used in 802.11a (a/k/a Wi-Fi) and 802.11g, 802.16 and WiMax.

about 4.5 to 21 MHz – well within current FCC and NTIA recommendations for non-intrusive radio frequency radiation.

Over the band, Telkonet's software filters control the power spectral density (PSD) of the signal, as well as apply 30dB notches required to avoid interference with low frequency sources, such as amateur radio operators. All Telkonet components are UL60950 listed and FCC Part 15 compliant. The radiation limits in the Federal Communications Commission's Part 15 Rules have successfully controlled the interference potential to licensed services while providing freedom for innovation.

The HomePlug technology contains a combination of sophisticated forward error correction (FEC), interleaving, error detection, and automatic repeat request (ARQ) to ensure that the channel is completely reliable to the network layer protocols. HomePlug, however, is intended primarily for the single family residential market, while Telkonet's iWire System™ is intended for large installations or multi-building environments that require network management. Leveraging and improving upon the HomePlug 1.0 standard, Telkonet's system is a robust, scalable networking solution that provides faster, more secure, and more stable data transmission than off-the-shelf solutions designed for the home market. In addition, the Telkonet iWire System™ is scalable to hundreds of users, more robust than commodity HomePlug products, and provides user management features unavailable in standard HomePlug products.

Telkonet's iWire System™ is the only PLC solution on the market that offers AES 256-bit encryption and is FIPS 140-2 certified, making it the only PLC solution on the market that meets the stringent security requirements for data transmission in U.S. government networks as set by National Institute of Standards and Technology (NIST) and the Department of Commerce.

By law, U.S. government purchasing agents must purchase solutions that are certified for FIPS 140-2 over ones that are not. The financial community also uses FIPS 140-2 as a benchmark for products handling monetary transactions, and recognized quality organizations such as the International Standardization Organization (ISO) and the American National Standards Institute (ANSI) have also adopted the standard. In addition to the government market, demand for AES-certified products is expected to increase in commercial markets that require the highest level of secure data encryption and privacy, such as financial, banking and medical information applications.

### **Regulatory Framework**

To the extent the PSC determines it necessary to regulate, MST advocates adoption of a technology neutral regulatory scheme that will allow providers to maximize their ability to deploy broadband Internet access services and facilities in competition with other platform providers, under a regulatory framework that provides all market participants with the flexibility to determine how best to structure their business operations. MST advocates that the PSC's goal in developing rules for BPL should be to provide a framework that will facilitate the rapid introduction and development of BPL systems. An open market for such services promotes competition that both makes service affordable and provides incentives for quality service and innovation in new technologies and service features.

That said, MST believes that a model that promotes the least level of direct utility involvement is most likely to achieve the aforementioned goals. MST believes that such a structure is particularly necessary in the In-House context, where companies unaffiliated with the utility controlling the electric lines desire to provide new service(s) to MDU residents, as MST

and Telkonet are now doing. Structural separation will ensure that regulated utility ratepayers do not subsidize unregulated entities.

In-Building has the potential to offer a broad array of products and services to both landlords and residents alike. Control over the wire to the building has the potential to create bottlenecks to competition that can be avoided through structural separation. For example, gone would be the incentive to favor its service, e.g., by imposing burdensome requirements, costs, or tests on the competitor – or even preemption of the competitor’s use of the wire -- over that of a competing BPL provider.

The PSC’s concerns over market dominance in the Access BPL marketplace apply equally in the In-Building marketplace. As a latecomer to the market, BPL’s success depends on the new and diversified applications it can provide to consumers, allowing consumers to distinguish BPL from other broadband products. The PSC must select a regulatory model that provides maximum access to independent companies, such as MST and Telkonet, that are investing, developing, and deploying new technologies.

### **Ownership of Wires**

MST asserts that the PSC must issue clarifying regulations or guidelines regarding ownership of the wires in the MDU context. In-Building providers often confront the issue of whether they must obtain permission from the MDU owner or the utility to operate over in-building wires. This issue exists in both the rental and owned context. The PSC should consider adopting interconnection rules and processes that should apply in this context. A further issue is the rate that independent BPL operators must pay when using the utility’s wiring in the building. Clarification of both issues should facilitate operations by independent BPL operators.

With regard to the first issue, the PSC should clarify that the utility owns the line up to the meter panel; beyond that demarcation point, the electric wiring is owned by the building landlord or owner(s). Such a ruling will provide In-Building providers with the unfettered access to the wiring that is necessary to the installation and deployment of their products and services.

Establishing interconnection rules and processes in the In-House context will allow the landlord or building owner/manager to decide which BPL operator(s) may serve the building. The landlord (or the condominium or cooperative board) is in the best position to weigh relative value and services than is the regulated utility that owns the connecting distribution wires and giving them the ability to make these decisions will work to the benefit of MDU residents. Likewise, building owners/managers must have the power to exclude such regulated entities. Any limitation on their right to exclude the unwanted signals of regulated utilities from their property works a per se taking under *Loretto v. Teleprompter Manhattan CATV Corp.*, 458 U.S. 419 (1982).

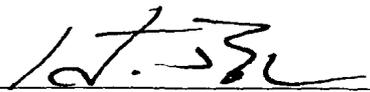
Second, MST supports a PSC established schedule of standard rates that the utility can charge for use of its wires. A fair and reasonable cost for use of the wires owned by the utilities might be based on the actual costs incurred, such as for any additional equipment or repairs. Clarity in this area will create greater certainty for BPL operators trying to enter the market and thereby encourage further deployment in MDUs.

**Conclusion**

Consistent with the discussion presented herein MST urges the development and adoption of appropriate regulatory rules and procedures such that will permit and foster the wide deployment of BPL and the broad range of enhanced services that may be provided by this technology.

Respectfully submitted,

**MICROWAVE SATELLITE  
TECHNOLOGIES, INC.**

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