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Summary of the Notice of Inquiry

1. The Commission seeks to obtain information and technical data on a variety of issues related to Broadband over Power Line (BPL) systems. BPL systems are new types of carrier current system that operate on an unlicensed basis under part 15 of the Commission's rules. BPL systems use existing electrical power lines as a transmission medium to provide high-speed communications capabilities by coupling RF energy onto the power line. Because power lines reach virtually every community in the country, BPL could play an important role in providing additional competition in the offering of broadband infrastructure to the American home and consumers. In addition, BPL could bring the Internet and high-speed broadband access to rural and underserved areas, which often are difficult to serve due to the high costs associated with upgrading existing infrastructure and interconnecting communication nodes with new technologies.

2. The Commission seeks information and technical data so that we may evaluate the current state of BPL technology and determine whether changes to part 15 of the Commission's rules are necessary to facilitate the deployment of this technology. While BPL may be deployed under our existing part 15 rules, the rules do not specifically provide measurement procedures that apply to systems using the power line as a transmission medium. We therefore seek comment on what changes, if any, we should make to our part 15 rules to promote and encourage the new BPL technology and to our measurement procedures for all

types of carrier current systems. We further encourage present deployment of BPL that complies with our existing rules, noting that if, or when, our rules are modified, those rules will address prospective compliance.

3. The Commission believes that the introduction of new high-speed BPL technologies warrants a systematic review of the part 15 rules in order to facilitate the deployment of this new technology, promote consistency in the rules and ensure the ongoing protection of the licensed radio services. We first seek to examine the new BPL technology and its various operating environments.

4. *Access BPL Systems.* Access BPL systems carry high-speed data and voice signals outdoors over the medium voltage line from a point where there is a connection to a telecommunications network. This point of connection may be at a power substation or at an intermediate point between substations, depending on the network topology. Near the distribution point to a residential neighborhood, a coupler or bridge circuit module is installed to enable the transfer of high-frequency digital signals across the low-voltage distribution transformer. Finally, the high-speed communication signals are brought to the home over the exterior service power cable from the bridge across the distribution transformer, either directly, or via an Access BPL adaptor module.

5. Several consortiums have been organized to promote Access BPL and its applications; however, the operating characteristics of Access BPL are not standardized. In order to assist us in understanding the current state of Access BPL, we seek comment and information in response to the following questions:

- What spectrum and bandwidth would Access BPL use? We have granted experimental licenses to some parties under 47 CFR 5 to evaluate Access BPL equipment that operates from 1.7 to 80 MHz. Would Access BPL devices operate in other portions of the spectrum and at what bandwidth?
- Is the spectrum used by Access BPL shared with In-house BPL? Are there any frequency sharing issues to be considered, *i.e.*, should we designate spectrum for Access BPL and In-House BPL? Is spectrum sharing between Access BPL and In-House BPL feasible?
- What data transmission speeds can Access BPL systems achieve? What speeds can be typically sustained under normal user environment conditions? What speeds are envisioned with deployed access shared among several

users? Are the speeds symmetric in both the transmit and receive directions?

- What are the modulation techniques? What techniques are used for ensuring the security of data? What schemes are used for contention resolution between Access and various In-House BPL devices, if more than one device needs to take control of the electric wire at the same time to communicate?

- Would Access products work with In-House BPL products and services, without the need for additional equipment, such as converters and adaptors?

- What is the status of development and anticipated timeline for market deployment of Access BPL equipment?

- What standards work has been done domestically and internationally on Access BPL and what are the results of such activities? Are there ongoing international standards activities that would benefit U.S. industry and what steps should the Commission take to encourage this work? We are aware that the IEC CISPR Subcommittee I on *Interference Relating To Multimedia Equipment*, Working Group 3 on *Emission from Information Technology Equipment*, is developing conducted emission limits for new BPL technologies. Are there other standards bodies involved in similar activities?

6. *In-House BPL Systems.* A number of high-speed In-House BPL devices have reached the market within the last few months, operating under our existing part 15 rules for carrier current systems. In-House BPL systems carry data and voice signals between the wiring and electrical outlets inside of a building. In-House BPL systems are aimed at home networking and sharing of resources between devices, such as multiple computers, printers and smart appliances. Each device to be networked is connected to a BPL adaptor module through a Universal Serial Bus (USB) or Ethernet port. The BPL adaptor module plugs into a power outlet and communicates over the electrical wiring with other similar BPL adaptor modules in the home, thus forming a peer-to-peer local area network between these devices. In-House BPL operation may provide Internet sharing or other external service connections independently of Access BPL service.

7. There are several consortiums organized to promote In-House BPL technology and its applications. In-House BPL networking capabilities would encourage the growth of smart appliances and other consumer electronics equipment, facilitating the sharing of resources between various devices and increasing productivity. In