

**Before the  
FEDERAL COMMUNICATIONS COMMISSION  
Washington, D.C. 20554**

In the Matter of )  
 )  
Amendment of Part 15 regarding new requirements ) ET Docket No. 04-37  
and measurement guidelines for Access Broadband )  
over Power Line Systems )

**COMMENTS OF:  
MICHAEL L. NOWACK, NA9Q**

As citizen and resident of the United States; an FCC licensed operator in the Amateur Radio Service; a practicing RF design engineer with 40 years of experience; and as a consumer of various RF based services, I submit the following comments, observations and recommendations.

**Introduction.**

I can understand the importance of making broadband and the services it will encompass available to all residents of the United States. However, it is important to understand that there exists a selection of technologies available to achieve this end. Without a doubt at some point in the future, Access BPL could become an important component in this endeavor. However, it is not the only available technology to provide broadband service and it is imperative to ensure each of these broadband technologies is implemented in a manner consistent with proper technical standards. Several Part 15 as well as licensed RF delivery systems now exist and are already in use throughout the country. Other more advanced technologies are now in rapid development and will very soon provide new additional delivery methods. In each case, the mature as well the developing technologies are providing broadband service without the risk of interference to existing HF or VHF licensed services. For example, several geo-synchronous satellite based, bi-directional services, already allow any resident of the United States to subscribe to high speed internet service at competitive rates. From the consumer viewpoint, these systems already provide broadband service totally independent of any land line based telephone or coaxial cable system. In comparison to these delivery systems, the impact to licensed services from deployment of Access BPL has yet to be firmly established. The present Part 15 rules for operation of carrier current services and emission measurements techniques have yet to be proven adequately valid in the case of Access BPL and may fail to ensure compliance with the non-interference requirements of Part15.

**Discussion:**

II. 22. *“Signals on power lines will tend to cancel each other out.”*

Testing by both the ARRL and the NTIA has shown that the assumption that power lines do not radiate is simply not valid. Emission levels in Access BPL test areas reveal significant interference levels to HF services from emission levels in excess of Part 15 limits. Further, the NTIA report calls into question the methodology of emission measurements for Access BPL systems under Part 15. Clearly the policy of using a 1 Meter high antenna to measure emission levels stems from the original scope of Part 15 which was aimed at device testing, not at a system level where the system may encompass an entire city or county. In the Access BPL case, the device under test, i.e. the power lines and associated equipments, are elevated well above the 1 Meter level. It is common practice in EMC *device* testing to place the unit under test and the test measurement antenna both at 1 M above a ground plane and proceed to make measurements at distances of about 10 Meters. Where there potentially exists such a great differential in height between the

unit under test and the test measurement antenna, such as is the case with Access BPL, a new test directive must be created to ensure emission compliance of Access BPL under Part 15 operation.

II. 24. *“Main.Net further indicates that it has successfully implemented its technology in trials and commercial operations in over 60 locations in 25 countries throughout the world.”*

If such testing has successfully been completed, then why are the proponents unwilling to share the data? Or, even more importantly, why weren't interested parties invited to observe or even participate in the testing. A simple assurance from the operator or provider cannot be taken at face value without supporting documentation. Test results and testing methodology must accompany the assertion of compliance. And, these results must be in the public domain for examination by interested or affected parties. There is too much at stake for the users of the HF and VHF spectrum that Access BPL could possibly affect.

The power grid and home distribution systems in use in this country were never designed to efficiently conduct RF energy. Designing a balanced RF transmission line to conduct RF energy efficiently and with out loss is to say 'without incidental radiation of signal'. HF broadcasters world wide use balanced lines to carry multi kilowatt signals from the transmitter output to the antenna system. They invest large sums of money to design and construct these lines just to minimize loss and incidental radiation. How could one reasonably expect a system of electrical transmission lines to have these same characteristics and conduct RF energy at the same efficiency at HF frequencies.

III. 33. *“We recognize that unlicensed operations in the HF band present a number of unique challenges, given the propagation characteristics of this range of frequencies”.*

The potential for interference with licensed services in the HF and VHF spectrum cannot be overstated. It is very difficult to believe that Access BPL could be installed across the power distribution system of this nation without interference becoming a reality. In my opinion it is not a possibility but only a question of to what degree and how extensive. This will only become more of an issue if long distance propagation occurs. Given the difficulties usually encountered in locating a single interfering signal source, with multiply sources in every community across the nation, Access BPL will become an unmanageable behemoth. A method of identifying individual signal sources must be a part of Access BPL technology. Some type of electronic tag must be included in each RF signal data stream to aid in locating the offending system.

III. 34. *“All unlicensed devices operating under Part 15 are subject to the condition that they not cause harmful interference and that they cease operation if they do cause such interference”.*

A clear standard must be established for defining 'Harmful Interference'. Many amateur stations engage in weak signal communications using low transmitter powers and weak signal modes such as CW and newer digital modes. Any significant rise in the ambient noise floor will prohibit these types of operations.

III. 34. *“..current part 15 levels will limit the harmful interference potential of Access BPL to relatively short distances around these devices”.*

While this may be true of single point source interferers, Access BPL systems could produce interference across the entire physical system. Allowing that few urban locations are further than 30 Meters from a power distribution line, it would seem that depending upon special separation is not practical.

III. 35. *“...many amateurs already orient their antennas to minimize the reception of emissions from nearby electric power lines.”*

While this may be true in a few cases, it is not a practical position. Most amateur antennas are oriented in compliance with the physical limitations of the owners property. This is especially true for the typical wire antennas amateurs use for frequencies below 10 MHz. Even with a rotatable antenna, the object is to rotate the antenna for best received and transmitted signal performance over the path to the other station. This will very likely be in an orientation other than that which minimizes the level of the interfering signal.

III. 41. *“Notching of specific frequency is technical feasible.”*

While it is apparent that this will accommodate some HF users such as frequencies used by governmental agencies, is it a practical approach for all HF users? With HF spectrum becoming more and more crowded with additional users in all services, how much notching can be done before the Access BPL system performance is affected. Is it not better to use a system that does not have interference issues and therefore not subject to so many adaptations just to get it into operation? Other technologies are available to do this same job without the interference issue.

III. 42. *“..we request comment on whether we should have specific requirements regarding the above mitigation approaches.”*

The process to resolve interference issues must be structured and have a timetable for resolution. Without these items written into the Part 15 rules, interference issues between providers and other licensed users could drag on indefinitely. Today, power line interference is a big problem in many areas and power providers and distributors do not have in general a good track record of timely actions.

III. 43. *“The Access BPL system operator would submit information on its system to an industry operated entity. .... would it be more reasonable to allow each Access BPL operator to maintain a database of its own rather than require a more centralized database?”*

The local public file is essential to allowing affected HF users access to system information to aid in interference resolution. Without a local system diagram and local contact information, interference issues are will place too much of the burden of signal source identification and resolution on the complainant.

III. 45. *“We tentatively propose that Access BPL systems ... be measured in-situ to demonstrate compliance with our Part 15 rules, at a minimum of three overhead and three underground representative locations...”*

Each system must be required to conduct a proof of performance test for the entire system with the resulting data to be available to the public as well as the FCC through a local public file. Also, periodic confirmation testing should be required for each system to ensure continued compliance.

#### **Summary.**

The process to establish the Part 15 regulations and standards which will govern the deployment and operation of Access BPL technology *must be* allowed to proceed carefully so as to not result in interference to and degradation of the capabilities of existing as well as future licensed radio services. Additionally, the timetable for this process should allow for full and proper evaluation of the emission measurement techniques and operational standards for Access BPL. Also, Part 15 rules for Access BPL must provide for the *local* reporting and resolution of interference complaints. The Access BPL technology must include an active power control feature, frequency notching capabilities, and most importantly, a remote shutdown feature to allow frequency adaptation, power reduction or even full shutdown of the system allowing quick resolution interference issues. Operators of Access BPL must also be required to maintain a local public file with system information and local contact information, and must provide for a fully structured process to quickly resolve interference complaints.

There should be no rush to market for a technology that may put other important services at risk of not being capable of fulfilling their purpose and mission. Further, the policy of licensed services clearly taking precedence over unlicensed Part 15 devices must not be discarded. Sufficient safeguards should be put into place to make certain that these rights are not trampled in the rush to implement a technology that possibly has many faults and interference issues.

In consideration of the above position, I respectfully submit to the Commission the following comments, suggestions and observations, in response to the issues raised in the subject Notice of Proposed Rulemaking:

Respectfully Submitted,

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