Dear Honorable FCC Commissioners:

Please consider the following information when drafting your final rules for BPL deployment. My expertise in the following comment rests with the direct testing of the ac-losses in superconducting transmission cables at the Oak Ridge National Laboratory in the mid-1990's and some of the cables tested (produced by Southwire Company) are now in use in various parts of the USA. One publication in this area can be found at:

J. W. Lue, M. S. Lubell, E. C. Jones, J. A. Demko, D. M. Kroeger, P. M. Martin, U. Sinha, and R. L. Hughey,"Test of Two Prototype High-Temperature Superconducting Transmission Cables", IEEE Transactions on Applied Superconductivity 7, 302-305 (1997).

Regardless of the final BPL frequencies utilized, BPL should avoid any ac-power installation utilizing superconducting components. These components include but are not limited to superconducting transformers, SMES (Superconducting Magnetic Energy Storage) devices, superconducting transmission lines, and superconducting generators. These novel units have only been in existence since the mid-1990's and were developed as a result of the 1987 discovery of superconductivity at temperatures in the liquid nitrogen range, i.e. 77 Kelvins.

See the Nobel Prize in Physics 1987:
http://www.nobel.se/physics/laureates/1987/

Superconductors are materials than conduct electrical currents with zero resistance (no loss) in DC currents. However, in an ac-environment, superconductors show nonnegligible and critically important ac-losses that must be considered when adding any HF or VHF signal to the cable. A more detailed discussion of various ac-losses in superconductors can be found at

http://ecjones.org/_papers/ACLoss.rtf

Any ac-currents add to the heating of these cables and these heating effects increase at higher frequencies. As a result, HF or VHF BPL are a serious threat to the functionality of these novel components to the US power grid and as a result BPL deployment should avoid these power grid components. As the USA attempts to improve the efficiency of our power grid for anticipation of future power growth, the use of high temperature superconductors will become of greater importance suggesting BPL deployment avoid areas of anticipated growth in US power demand.

If BPL is deployed on a superconducting cable, that cable is subjected to an adverse effect called "quenching" which causes the cable to heat to temperatures above the superconducting transition temperature, Tc, which in turn causes the liquid nitrogen to boil off jeopardizing the integrity of that power grid component.

As a result, BPL deployment should avoid all areas utilizing superconducting components and failure to do so could jeopardize the integrity of the US Power Grid in that region.

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