Before the
Federal Communications Commission
Washington, D.C. 20554
In the Matter of

Amendment of Parts 2, 15, 80, 90, 97, and 101 of the Commission's Rules Regarding Implementation of the Final Acts of the World Radiocommunication Conference (Geneva, 2012)(WRC-12), Other Allocation Issues, and Related Rule Updates **(ET Docket No. 15-99)**

Recommendations for co-existence of amateur operations and power-line communications in the proposed 630-meter and 2200-meter amateur bands (472-479 and 135.5-137.5 kHz, respectively).

I have been coordinator of the ARRL 500-kHz experiment since its inception in 2004. However, I am filing these comments on my own behalf as an amateur-radio operator and an electronics engineer with over forty years of experience in radio communications. These comments do not necessarily reflect the opinion of the ARRL or any other organization or individual.

A cornerstone of the FCC's approach to allowing amateurs and power-line communications to share the proposed 630-meter band is physical separation. Described below is my recommended approach to managing the separation distance.

My approach is based upon the following:

- My previous filing (GMRR RN15-30, filed August 29, 2015) calculates the expected signal-to-interference (S/I) ratios for PLC and amateur signals, based upon published field-strength measurements. This filing shows that amateur operation with 5 W EIRP from a transmitter as close as 300 meters to a power-transmission line will not cause harmful interference. In fact, harmful interference is unlikely even as close as 100 meters.

- The ARRL 500-kHz experiment has logged over 180,000 transmitting hours from a variety of different locations, many of which are quite close to power-transmission lines. There have been no reports of interference. Details are also given in the previous filing.

I therefore propose the following:

(1) The "Restriction/Coordination Distance" (RCD) should be 300 meters.

(2) If the amateur is located more than the RCD from power-transmission lines, then the amateur may operate with the full permitted power (5 W EIRP in most places, 1 W EIRP in parts of Alaska) without further concern or coordination.

(3) It is unlikely that the power-transmission line in question has a PLC signal in or near the amateur band. Even if the PLC signal is present, the analysis cited shows that interference is unlikely in the vast majority of cases. The following procedure will ensure that the amateur will not cause harmful interference to the PLC system:

(4) The first step is to determine whether or not the nearby power-transmission line has PLC signal(s), and if so, whether their frequencies are within the amateur band or sufficiently close to be vulnerable to interference. Given access to the UTC PLC data base, the ARRL would be ideally suited to perform this coordination.

(5) Depending upon the specific PLC frequencies and bandwidths, part of the band may be unrestricted, while the rest may require coordination.

(6) When coordination is needed, the best method is measurement of the amateur signal that is picked-up by the transmission line and delivered to the PLC receiver. The allowable power is set to produce a 10-dB signal-to-interference ratio, or such other S/I ratio as is needed by the PLC.

(7) Previous operation of an experimental station at the same site with no interference complaints should also be evidence of compatibility.

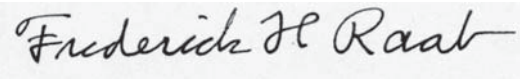
Ultimately, both amateurs and PLC operators will benefit from frequency separation, as this will eliminate both hassles and mistakes. The author therefore further recommends:

(8) Control and monitoring of the power grid is a serious business and warrants more than an unlicensed part-15 communication system. Infrastructure PLC systems should become a recognized radio service. This (in contrast to part 15 rules) will entitle them to protection from interference. However, it will also impose responsibilities. One of these is keeping technology up to date and not demanding more bandwidth than is really necessary. Recently, land-mobile operators recently had to change from 25-kHz channel spacing to 12.5 kHz to make more channels available. The same logic applied to PLC systems would mandate reception bandwidths commensurate with the data rates; e.g., 1 kHz for 500 b/s data. This would both allow more PLC operations in the same amount of spectrum and also greatly reduce their susceptability to interference. The excessive bandwidth of older PLC systems is a key factor in the high signal-to-interference ratio that they require.

(9) No new PLC systems will be permitted in amateur bands. New PLC systems near the edges of the amateur bands cannot object to interference from amateurs operating in the band.

(10) Those systems currently operating in the amateur bands should gradually transition to other frequencies or to fiber-optic cables. This can be done over a 3 to 5-year period with negligible extra expense by incorporating the changes into normal maintenance and upgrade cycles. In many cases, these changes will be quite easy. The bandwidth of the traps used in the power-transmission lines is typically much larger (20 to 50 kHz) than the proposed amateur band. Consequently, the PLC frequency can be moved outside the amateur band without replacing or retuning the traps. For modern DSP-based PLC modems, the frequency change is a simple matter of reprogramming or toggling a switch.

Respectfully submitted



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