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The FCC has taken the position that Access BPL can be implemented by amending the current rules for Part 15 Radio Frequency Devices. I consider this completely inadequate. The technical aspects of BPL will lead to wide spread interference from 2 – 240 MHz. There will be significant RF energy present in the base frequency range of 2 – 80 MHz and unless strict spectrum control techniques are employed there will be significant energy present through the 3rd harmonic. The very nature of connecting moderately low power broadband transmitters to unshielded wires of significant length will create local area signal strengths of sufficient level to disrupt communications on those frequencies and harmonics of those frequencies. In the case of 2 – 30 MHz spectrum the effects could cover several hundred kilometers. It will create a raised HF (2-30 MHz) noise spectrum that will make marginal commercial and amateur radio operations more difficult. If a BPL device is connected to a power line whose length is greater than ¼ wave length at the lowest frequency then significant signal propagation will occur. These signals could be "heard" for significant distances. The ARRL has already physically demonstrated disruptive interference from BPL. The city of Linz Austria shut down BPL providers in 2003 because of interference to critical communications services. Part 15 rules are just not sufficient enough to prevent interference and resolve issues. The FCC should write new rules that require:

- All BPL devices, system installations, operations must be designed and installed in such a way the near field shall not be greater than 1 meter in any direction from any BPL device, any part of the BPL system, at any frequency, at any harmonic of a primary frequency.
- All BPL devices, system installations, operations must be designed and installed in such a way that radiated signal levels are below minus130dBm from 0 to 90 degrees above the horizon when measured with a ½ wave dipole, mounted ½ wave length above the ground in the far field at the point where the far field begins from the BPL system. This requirement shall hold for any frequency or harmonic.
- All BPL providers automatically adjust their primary frequencies in the 2 – 30 MHz portion to correlate with the time of day, 30 day sun spot data, and the 11 year solar cycle such that the only frequencies used are 50% above the MUF at any time.
- The BPL system must employ filtering and/or modulation techniques such that the second and subsequent harmonics of any frequency are at least 50 dB down from a primary frequency.
- System certification shall be required to start and continue operation. This certification shall require a complete spectrum sweep of the BPL system at its

worst operating conditions. It shall also require a "real" world test for interference. The BPL provider shall prove it does not interfere with any service on any frequency at any time by actual demonstration.

- Area interference studies shall be completed and shall include coordination with all individual spectrum users with in a 25 km radius of any BPL device and system.
- Licensing and coordination of specific operating frequencies of all BPL providers with in a 100 km of each major deployment area to prevent inter-mod problems.
- All proposed deployments with in 100 km of other national borders are coordinated with the appropriate regulatory agencies and individual users in the affected nations.
- Imposition of "assumed" liability to the BPL provider. The BPL provider shall be completely liable for any interference caused by their system. The BPL provider shall bear all the cost of interference elimination and be financially responsible for any damages or loss of use to other spectrum users.
- All BPL providers, at their cost, make available a 24 hour 7 day a week interference elimination service.
- BPL operators to discontinue operations on their entire system if they are causing interference to any service at any time under any conditions.
- Automatically escalating fines on BPL providers for any interference regardless of reason. These fines should be tied to the CPI and start at $10,000, 2004 dollars, per occurrence. Fines will increase 50% for each additional occurrence. There shall be no maximum fine.
- That no existing non-BPL spectrum user be required to modify, change operation, purchase new equipment, re-orientate antennas, employ filtering, etc to eliminate interference from Access BPL. All interference elimination will be done by the and at the expense of the BPL provider.

The FCC needs to treat Access BPL as special case broadband radio transmitters not as Part 15 devices. The FCC must take an active role in any interference resolution exercise it its authority in resolving interference to any existing spectrum users.

I have the following additional comments.

Para. No. 10 states a number of parties believe there is a realizable benefit from BPL. - Prove it. BPL will have to compete with DSL, Cable internet, wireless internet. These services already provide reliable, reasonably priced services with little to no impact to users in the 2 – 80 MHz spectrum. Access BPL service is not a valuable new service, it will hamper national productivity because we will spend countless dollars correcting interference problems, and provide no real economic opportunity. I concur with Lee McVey, para. No. 15, suggestion that the FCC concentrate on a more practical and useable fiber optic network.

Para. No 12 states that Access BPL will make it possible to bring broadband services to rural other underserved locations. - This entire notion just does not make sense. The cost

of system deployment would likely make it economically prohibitive to implement for a scattered user base. BPL will have the same problems as DSL and Cable. If the BPL industry believes there is a benefit prove it with real substantiated numbers. So far they are guessing.

Para. No. 13 states the electric utility industry could use BPL technology to improve the provision of electric power service. This comment comes from an industry that bungled power de-regulation in California and allowed a major black out to occur in the north east US in 2003. The electric power industry should concentrate on its core business and not venture into areas it does not understand.

I concur with ARINC's, para. No. 17, concern for interference to HF aircraft communications. In fact wide spread deployment of Access BPL near, < 25 km, airports, ARTCC antennas, TRACON antennas, Marker beacon transmitters, Localizer, VOR/VORTAC (108 – 118 MHz) navigation aids will lead to reduced margin of safety in aircraft operations. How does the FCC and the BPL industry intend deal with this? The aviation industry can not afford service disruptions and the imposition of new technical requirements. The aviation industry is far more critical to the future of this nation then yet another unproven broadband internet service.

Para. No. 23 – Current Technologies states BPL emissions fall off very rapidly from a BPL source. One has to assume the same laws of physics apply to BPL as it does to any radio frequency generating device. BPL signals will drop off at a rate equal to the inverse square of the distance in the far field. Therefore one can expect significant signal strength several kilometers from the source. Current Technologies goes on further to say that power lines will make an inefficient radiator due to mis-match. Mis-match is how efficient the BPL source couples to the antenna. Power lines themselves can make very efficient antennas. A power line that is ½ wave length long and ½ wave length high at any BPL frequency will be an efficient radiator. This is basic antenna theory. What theory is Current Technologies using?

Para. No. 24 – Current Technologies states that the aggregation of BPL signals is unlikely. Current Technologies needs to define unlikely. If enough BPL devices are deployed there will be aggregation and inter-mod. It will not be preventable without sophisticated control techniques.

The FCC states in para. No. 35 - "We therefore would expect that, in practice, many amateurs already orient their antennas to minimize the reception of emissions from nearby electric power lines." Actually in practice amateur radio operators orientate their antennas based on type, installation limitations, economic considerations, and in fact may be orientated so maximum RF coupling to power lines is possible. The FCC has made an incorrect assumption. Where did the FCC gets its information from?

The FCC in para. No. 36 disagrees with the ARRL on possible wide spread interference caused by BPL devices connected to over head power lines. The fact remains once a RF source is connected to unshielded wires these wire will act as antennas. These signals will

radiate and will be received by all users of that spectrum. In fact overhead power lines are of sufficient height above ground that they will act as efficient RF radiators at certain frequencies. E.g. A BPL device mounted mid point in a city block over head power line will act as an effective dipole antenna for frequencies above 2 MHz.. This antenna will exhibit real gain above 7 MHz.

The FCC states in para. No. 37 that "With regard to potential interference to the non-amateur radio services, such as public safety, maritime and other operations, we believe that the risk of harmful interference from Access BPL operations is low." Does the FCC intend to define "low"?. The aviation industry has to quantify risk with actual defensible numbers. The FCC says the risk is low. Then quantify it. Better yet place a requirement on the BPL providers to proof they meet a standard of non-interference with a certain probability. Are the FCC and the BPL industry willing to accept any real risk to aircraft communication, navigation, police, fire, and emergency services?

Finally, I am disgusted that yet another technology is being pushed with out proper recognition of all the impacts. APCO, ARRL, ARINC, CORF, FEMA, NASWA, and the NTIA have all raised valid concerns. Why is the FCC proceeding without further study? What's the rush? BPL is simply not that important. There are already sufficient broadband services available and there are much better technical solutions than BPL for additional services. BPL providers want to intrude on a significant existing user base. They want special consideration. Why should they get any consideration? Let them prove they do not cause a problem at any time under any condition. They should do this at their own expense.

Given the sensitivity of the subject and the technical issues why doesn't the FCC directly solicit input from all the existing 2 – 240 MHz spectrum users? Why doesn't the BPL industry understand possible impacts to existing users? They are making conclusions based on limited BPL deployments, lack of sufficient understanding of the existing spectrum users, and lack of adequate data. The BPL industry also seems to lack basic understanding of RF signal propagation nor do they seem to care about its impact.

The 2 – 80 and the 80 - 240 MHz spectrum have a large user base. Each service is likely to see an impact by wide spread deployment of BPL.

- The aviation community is still suffering from 9/11 and over all economic conditions. It simply can not afford another impact. Is the FCC and BPL providers ready to deal with aircraft operation disruption and reduced safety margins?
- Emergency service agencies are already complaining of interference issues on their frequency allocations. Is the possibility of interference to police, fire, and medical emergency providers worth it?
- Radio Astronomy users watched their spectrum shrink significantly over the years. How much do we take?
- Amateur Radio operators have had to deal electric utilities that ignore interference complaints, over zealous home owner associations that forbid radio transmitters

and antennas, intrusions from illegal radio operations, etc. BPL will make it more difficult to operate in already adverse conditions.

The proposed rules are simply inadequate and new ones are needed. BPL should not be given special consideration and the proposed rules should not be implemented. Wide spread BPL deployment should not be allowed until there is undeniable proof that the existing user base will not be interfered with under any conditions at any time. New rules also need to address pre-emptive interference elimination and must allow the FCC to pull the plug on Access BPL any time interference occurs.