

**BEFORE THE FEDERAL  
COMMUNICATION COMISSION  
Washington DC 20554**

In the Matter of )  
 )  
Carrier Current Systems, including ) ET Docket No. 03-104  
Broadband over Power Line Systems )  
 ) ET Docket No. 04-37  
Amendment of Part 15 regarding new )  
requirements and measurement )  
guidelines for Access Broadband over )  
Power Line Systems )

**REPLY FOR UPLC PETITION**

UPLC petitioned 2 modifications to the new BPL rules:

1. UPLC do not want a 30 days notice to the data base. Obviously ARRL wants it because they want to know ahead where to go to measure the in-site FCC part 15 limit to complain. It is obvious because Satius knows and measured several BPL devices that will have a hard time to meet the new FCC in-site measurement limits for access BPL.

Satius comment: Satius do not know which one is right but if there will not be a control mechanism then too many BPL manufacturer will deploy too many devices which harmonics could add up at certain time, certain frequency and location and could cause serious emission.

2. UPLC do not want their current BPL devices to be retired by July 7, 2006 - UPLC want an additional 18 months to retire their current BPL devices on the field.

First, it is believed to be that not more then couple thousand BPL units are installed for testing purposes, therefore to retire those devices should not take much time, much loss of business, nor need additional 18 months extension to do the same.

As of now based on Satius +20 years power line communication experience the emission from the current BPL devices can change in a large variation to even 30-40 dB above the limit at certain time and location. Furthermore,

the current BPL devices are very highly polluting the entire RF spectrum with harmonics. If FCC will allow the current BPL devices to stay operating after July 7, 2006 then it will cause more work and administration for FCC because we believe ARRL and maybe others will fight very heavily against BPL and FCC could end up getting 100's of complaints a day against current and future BPL devices.

Satius comment: FCC will get too much work and headache from the new BPL devices already, since Satius and Intellon's VP of Engineer do not believe any of the BPL operators will meet the new FCC rules for Access BPL. UPLC knew it for at least 2 years ago that the level of emission several BPL operators are having are well above the new FCC limit and the new rules will be coming soon so they should have worked on resolving these technology problems long time ago. UPLC also knew for at least for a year that Satius had the solution to these problems however UPLC decided to leave these issues in the lawyers hand to fight FCC instead of dealing with the the "makes sense technology hand". Adding more problems to the fire by allowing the current BPL devices to operate beyond July 7, 2006 will be a serious fight. Satius believes to treat every BPL competitor at the same level and to try to avoid big messes with ARRL and other radio operators like the FAA, the best solution should be to deny UPLC request and thereby the current BPL devices should be retiring by July 7, 2006.

## PROBLEMS BPL HAS BELOW 80MHZ AND THE SOLUTION

### BACKGROUND

Satius has more than 20 years experience in power line communication, has the most number of patents related to power line communication and Satius patented and found the solution to the current BPL problems that works between 1.7-80 Mhz. Satius field tested BPL units in several place on this earth to prove that Satius technology can communicate directly through any size transformers (and between all 3 phases without injecting signals to each power line phases) without any installation on or around the transformers at currently 80 Mbps speed that futures several Gbps and for longer distances than any other BPL technology by meeting the new FCC rules.

### THE PROBLEMS RELATED TO BPL WORKING BETWEEN 1.7 to 80 Mhz

1. SPEED - The communication speed of any device are limited by the bandwidth. Most BPL companies are using frequencies from 2-80 Mhz. Though most of them are operating from 2- 50 Mhz only because the

TV broadcasting stations starts at 50 Mhz to 80 Mhz. Between this 2-50 Mhz specially below 30 Mhz there are lots of licensed radio operators which transmission are still based on analog signal processing. These operators include ARRL, navigation and other radio stations. FCC do not allow BPL transmission on certain frequencies of those. Consequently the allowable bandwidth is small for high speed data transmission for BPL. Furthermore the noise level is high due to too many devices are using these bands. Higher modulation factors can be used to increase speed but those needs higher signal to noise ratio. So, for short distance it is possible to reach higher speed but for longer distance the speed will fall back to the same couple of Mbps or even to couple of hundred Kbps data throughout.

Satius uses high frequencies where RF digital signal processed devices are located some times and therefore Satius can use Ghz of bandwidth consequently reach Gbps speed. The noise level at those Ghz frequencies are much lower then at 30 Mhz.

2. NEW FCC EMISSION RULES FOR BPL - The FCC emission requires to measure the emission level on the site, not in the lab. Based on +20 years experience and recent measurements other BPL companies fundamental and harmonics emission can vary as high as 40 dB above the in-site measurements emission levels. The technology other BPL companies are using like the inductive coupler acts like a bad antenna for emission, and do not match the power line characteristic impedance, therefore emission will change in time and location. Harmonics of such system can interfere with the entire RF spectrum. If such BPL operators would decrease its transmit level by 40 dB then it is likely that not even 100 yard distance communication will be achieved by such BPL device and make those devices no longer economical sense to deploy. Furthermore, based on experience if such BPL devices would be deployed on wide scale then it is possible that the (due to incorrect matching) emission such emission levels from each BPL devices could add up time to time and create the bad oscillation or interference device. ARRL reported BPL interferences a mile away from a BPL transmitter at below 30 Mhz. Most European countries still not deploying BPL devices only test them to find the same conclusion. However, European authorities are open to find a BPL device which emission is stable low with no harmonics and can avoid interference with any other licensed users. If other BPL users (which do not match the power line characteristic impedance at all the time and all location) are shutting down certain band to avoid interference with licensed users usually will not be effective because the harmonics of such un-matched system will create more harmonics

which will fill the shut down bands with harmonics.

Satius uses higher frequencies and can meet the new FCC in-site emission measurement rules. Satius emission level is typically 20-40 dB lower than other BPL devices at the same transmit level, and Satius devices do not have harmonics. Furthermore, Satius technology has the uniqueness to match the power line characteristic impedance at any time and any location therefore it can meet the new FCC rules and still provide long distance communication over the power line and through any size transformer. Furthermore, Satius technology can uniquely shut down certain frequency bands by 20-40 dB to avoid RF interferences with licensed users without filling the shut down band with additional harmonics (due to true matching). Higher than 200 Mhz frequencies BPL emission dies out within 100 to couple 100 yards thereby avoiding interferences in the nearby licensed operators.

3. TRANSFORMERS - The distribution transformers are an obstacle for other BPL operators below 80 Mhz. Without installing some devices around or next to the transformers such devices can not communicate through all size of transformers. Installing any devices on the mid-voltage power line is not safe and installing devices on all transformers are very un-safe and too expensive.

Satius can communicate through any size transformer without installing any devices on or around the transformer at much higher speed and for longer distances than any other BPL devices.

4. SAFETY - Mid Voltage power lines are a very good receiver for surges and lightnings. Certain areas of the USA where the most market is for BPL, in rural areas, has very high temperatures with low humidity that can cause very high surges even almost every seconds. These surges can even jump the best insulators and blow them up one by one.

Satius uniquely developed a capacitive coupler that matches the power line characteristic impedance at all the time and all locations which can work at such areas that has high surges and lots of strong lightnings. Satius coupler was demonstrated to stand more than 100 KV DC surge/lightning related voltages even continuously.

## CONCLUSION

Both Petition by UPLC should be denied by FCC to avoid further fighting and

problems.

Respectfully Submitted,

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