

The Commission asks several questions in the Notice of Inquiry.

In this comment, I will respond to several of the questions, and I will also raise some questions that were not asked in the Notice.

Questions from the Notice:

1. "Is there a need to define frequency bands that must be avoided in order to protect the licensed users on the same frequencies as those used by Access BPL systems? Are there mitigation techniques Access BPL systems can use to avoid possible interference with licensed users of the spectrum, such as mobile users or public safety and law enforcement users who may be traveling directly beneath the medium voltage lines?"

The present standard for HomePlug has designated protected bands, specifically the amateur bands. As a minimum, I would expect that Access BPL specifications would protect those same bands. The problem I see is that there are other weak-signal users of HF and MF bands: short-wave broadcasters, radio-astronomers, and time/frequency services, for a few examples. Without some mitigation of the increased noise level from Access BPL, these services face a severely reduced level of usability.

2. "Since Access BPL equipment is installed on medium voltage lines that supply electricity to a residential neighborhood, should this equipment be treated as operating in a residential (Class B) or commercial (Class A) environment?"

Access BPL equipment must all be treated as Class B (residential) equipment. This is one case in which the FCC can and must stand firm. A lax enforcement of Class A vs. Class B equipment certification for Access BPL will make an already bad situation (personal computer equipment emissions) even worse.

3. What mitigation techniques are used by In-House BPL systems to avoid possible interference with licensed radio services, such as amateur radio, fixed, mobile and broadcast services? Is there a need to define frequency bands that must be avoided in order to protect the licensed services that use the same frequencies as In-House BPL systems?"

I do not know what mitigation techniques are used. As I stated above, in my response to question 1, I believe that all of the amateur, fixed, mobile, and broadcast users of licensed HF allocations must be protected.

4. "What are the probable interference environments and propagation patterns of Access BPL and In-House BPL systems? Are there specific issues of interference that we should address, e.g. an increase in the level of the noise floor? What models are available for predicting radiated emissions from access BPL systems?"

The noise floor for HF communications is naturally increased by geomagnetic storms, and the propagation of MF and HF signals (as well as noise from systems like Access BPL) is significantly enhanced by variations in the 11-year sunspot cycle. Any

prediction of the effects of radiated emissions MUST take into account the long-term variation in HF propagation due to sunspot activity.

5. "Are there test results from field trials of Access BPL that may assist in the analysis of harmful interference? Inasmuch as In-House BPL equipment is already on the market, are there any reports that may assist in the further analysis of harmful interference?"

Results from field trials in Europe and Japan are available from ARRL. These reports indicate, for the most part, that Access BPL produces an unacceptable level of harmful interference to HF communications.

6. "How should the Part 15 rules be tailored both to ensure protection against harmful interference to radio services and to avoid adversely impacting the development and deployment of this nascent technology?"

Because of the potential wide deployment of Access BPL, the Commission should tailor the Part 15 rules to provide for an active regulation of the Access BPL environment, rather than the passive approach that the Commission has appeared to take in cases such as interference to RF-susceptible telephone instruments by licensed services.

7. "Given their different operating environment, is it necessary to tailor the rules to differentiate equipment used specifically in Access BPL and In-House BPL applications, or should one set of general limits be applied to both? What should such limits be and what is the technical basis for them?"

It is clear that the rules for Access BPL applications must account for propagation of their radiated emissions over long distances. In-House BPL applications should be subject to radiated/conducted emission limits that obviate the need for after-market filters we now see with DSL.

8. "Should the Part 15 rules specify both radiated emission limits and conducted emission limits for BPL systems, or would one type of limits be sufficient to control interference from both low speed and high speed BPL? Since all carrier current systems inject RF signals into the power line for communication purposes, would conducted emission limits be more appropriate to protect authorized radio services?"

It would be prudent for the Commission to specify both radiated and conducted emission limits for BPL systems, both Access and In-House. An inadequate approach to these limits would open the door for the destruction of HF communications.

Questions not asked in the Notice:

1. Are there long-term MF and HF propagation effects that should be considered in evaluating the interference potential of BPL operation?

There have been several studies conducted, and more are under way, that evaluate the interference effects of In-House BPL. The interference effects of "Access BPL" have been calculated, but not actually measured under heavy-use conditions, because the measurement of broadband interference is difficult. My main concern with this issue is that little or no measurement or evaluation has been done regarding the interference potential of "Access BPL" in periods of high sunspot activity. We are presently experiencing a normal Solar Minimum, in which HF propagation is naturally reduced. I expect that "Access BPL", in a Solar Maximum situation (in about six years) will produce noise that will be propagated all over our planet. That sort of propagation shift has produced surprises in the past (I have heard that Germany's tank commanders got some surprises during WWII). The effects of a propagation shift, combined with a boom in "Access BPL" in the US, could wipe out HF (short-wave) broadcast reception in many less-developed countries who depend on short-wave broadcasts for news and entertainment. In a Solar Maximum, an HF listener (especially an amateur radio operator) can virtually "hear a pin drop" anywhere on the globe. During a Solar Minimum, as we have today, the noise washes out weak signals. In summary, I believe that the long-range, long-term propagation effects must be taken into account in any balanced assessment of the interference effects of BPL, specifically "Access BPL".

2. Are Access BPL and In-House BPL users susceptible to interference from licensed services? What action should be taken in case of interference?

My opinion is that Access BPL and In-House BPL will both be susceptible to interference from the licensed services, spread-spectrum modulation notwithstanding. When such cases arise, there will be a hue and cry from the non-technical consumer for some immediate Commission action. I don't believe that the Commission's current "Part 15 must accept interference and must not cause interference" position will withstand that pressure. The worst case scenario, in my opinion, would be a repeat of the Commission's 11-meter/Citizen's Band regulatory debacle.

3. It appears that the U.S. AM Broadcast Service is already designated for protection against interference from Access BPL. Why would this service be protected, while the large number of services in the 1.8 MHz to 80 MHz range would not?

I suspect that the proposed protection of AM Broadcast is the BPL equipment manufacturers' idea. It is not obvious that AM Broadcast should get special treatment, nor is more susceptible to interference than other services in the 500 KHz - 80 MHz range.

4. In a recent FCC Report and Order, the allocation of spectrum around 130 KHz to the Amateur Service was denied on the basis of a suggested risk to the safety of the national Power Grid, if amateurs were allowed to transmit in that range. If the power grid is susceptible to such interference, is it also capable of radiating harmful interference?

The addition of high-pass filter devices to the power grid,

specifically to permit transmission of revenue-producing services within the power grid, concerns me. It seems that the manufacturers and the power network owners are so anxious to get this technology deployed that they will not take a serious look at the impact of adding these new devices to the power grid. I have worked with electronic and computer systems for many years, and I understand the fundamental facts of complexity versus reliability. When complexity increases, reliability decreases, unless serious measures are taken to prevent it. I would rather the power companies not tinker with their working, reliable system in search of a new revenue stream, no matter how big they think it is. Those who now are "underserved" with broadband Internet service will enjoy their newfound access, but will not appreciate the financial and political nuances of a decision that leads to a failed power grid.

I hold an Amateur Radio license, with the call sign AB5XZ. I have been involved in Amateur Radio since 1960. I have a Bachelor of Science degree in Electrical Engineering and a Master of Science degree in Telecommunications. I am a licensed Professional Engineer in Texas.

Respectfully yours,

Thomas P. O'Brien, P.E.