

**Before the  
Federal Communications Commission  
Washington, D.C. 20554**

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

**COMMENTS ON NOTICE OF PROPOSED RULE MAKING**

To The Commission:

I have a B.S. in electrical engineering, have in the past worked for a power and distribution transformer manufacturer, a manufacturer of amateur radio equipment, and a manufacturer of semiconductor IC's, and I've been chief engineer for a couple AM radio stations while holding a First Class Radiotelephone license. I have held an amateur radio license for over forty years, of the extra class for thirty. I've published articles in two ham radio magazines and one company newsletter. I've had my share of experience on the ham bands including Worked-All-States (WAS) and Worked-All-Continents (WAC) certificates using no more than five watts output from or ten watts input into my transmitter, many evenings operating HF portable in the parks, and pedestrian mobile on ten meters. I have come across and dealt with various noise and interference problems from Part 15 devices which I've either solved, compromised with, or moved away from.

My comments herein on NTIA Report 04-413<sup>1</sup> are general to the point of restricting them to its cover letter of April 27, 2004, which I quote in part:

Federal Communications Commission (Commission) and NTIA have solved some of the most difficult spectrum challenges facing our country. ...

Now, President Bush has offered us another opportunity ... On March 26<sup>th</sup>, President Bush established the bold goal of universal and affordable broadband access for every American by 2007. Yesterday President Bush provided a roadmap on how we can achieve this vision by, among other things, encouraging the development of new technologies. In this regard, the President called for "technical standards to make possible new broadband technologies, such as the use of high-speed communications directly over powerlines." <sup>2</sup>

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<sup>1</sup> <http://www.ntia.doc.gov/ntiahome/fccfilings/2004/bpl/>

<sup>2</sup> President George W. Bush, Remarks at the American Association of Community Colleges Annual Convention, Minneapolis Convention Center, Minneapolis, Minnesota (April 26, 2004) (available at

...  
Part of NTIA's proposed solution is to protect 41 frequencies for the most sensitive and likely most severely affected federal systems. Protecting these frequencies, which represent less than 6 percent of the frequency capacity of BPL systems, will go a long way toward addressing potentially serious interference concerns. Other reasonable mitigation techniques suggested in the NTIA Report include local registration, intelligent power management, interference absorbing filters, frequency selection, signal injection, and the use of a web-based interface for potentially affected parties.

In the April 26, 2004, "roadmap" speech<sup>2</sup> that NTIA referred to, the portion relating to BPL itself is short enough for me to quote here to keep its ideas in context:

### **"A New Generation of American Innovation"**

...  
And I want to talk about affordable broadband technology so that America can stay on the leading edge of technological change.

...  
The third goal is to make sure that we have access to the information that is transforming our economy through broadband technology. I'm talking about broadband technology in every part of our country. I was the governor of Texas for a while. I remember talking about access to information and there was always a group of people saying, that's fine, big cities get it but rural people don't. I'm talking about broadband technology to every corner of our country by the year 2007 with competition shortly thereafter. (Applause.) Educators understand the great value of broadband technology. I mean, the -- I'm not surprised that people involved in the community college system, when you mention broadband technology nod their heads. It's the flow of information and the flow of knowledge which will help transform America and keep us on the leading edge of change. And we've got to make sure that flow is strong and modern and vibrant. And by the way, we've got to make sure that there's competition for your -- for your demand. We need more than just one provider available for not only community colleges but also for consumers. In our society, the more providers there are, the better the quality will be and the better the pricing mechanism will be.

Central Piedmont Community College in Charlotte is using broadband to conduct classes for students all across their state. You know, one of the interesting opportunities for the community college system is to provide education opportunities for people who work out of their home, for example. And the expansion of broadband technology will mean

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<http://www.whitehouse.gov/news/releases/2004/04/20040426-6.html>).

education literally will head into the living rooms of students. That will even make the system more flexible and more available and more affordable.

...

Now, the use of broadband has tripled since 2000 from 7 million subscriber lines to 24 million. That's good. But that's way short of the goal for 2007. And so -- by the way, we rank 10th amongst the industrialized world in broadband technology and its availability. That's not good enough for America. Tenth is 10 spots too low as far as I'm concerned. (Applause.)

Broadband technology must be affordable. In order to make sure it gets spread to all corners of the country, it must be affordable. We must not tax broadband access. If you want broadband access throughout the society, Congress must ban taxes on access. (Applause.)

Secondly, a proper role for the government is to clear regulatory hurdles so those who are going to make investments do so. Broadband is going to spread because it's going to make sense for private sector companies to spread it so long as the regulatory burden is reduced -- in other words, so long as policy at the government level encourages people to invest, not discourages investment. And so here are some smart things to do: One, increase access to federal land for fiberoptic cables and transmission towers. That makes sense. As you're trying to get broadband spread throughout the company, make sure it's easy to build across federal lands. One sure way to hold things up is that the federal lands say, you can't build on us. So how is some guy in remote Wyoming going to get any broadband technology? Regulatory policy has got to be wise and smart as we encourage the spread of this important technology. There needs to be technical standards to make possible new broadband technologies, such as the use of high-speed communication directly over power lines. Power lines were for electricity; power lines can be used for broadband technology. So the technical standards need to be changed to encourage that.

And we need to open up more federally controlled wireless spectrum to auction in free public use, to make wireless broadband more accessible, reliable, and affordable. Listen, one of the technologies that's coming is wireless. And if you're living out in -- I should -- I was going to say Crawford, Texas, but it's not -- maybe not nearly as remote. (Laughter.) How about Terlingua, Texas? There's not a lot of wires out there. But wireless technology is going to change all that so long as government policy makes sense.

And we're going to continue to support the Federal Communications Commission. Michael Powell -- Chairman Michael Powell, under his leadership, his decision to eliminate burdensome regulations on new broadband networks availability to homes. In other words, clearing out the underbrush of regulation, and we'll get the spread of

broadband technology, and America will be better for it.  
(Applause.)

Oh, how soon we forget! Do you recall a speech by President Franklin D. Roosevelt in 1932 foreshadowing the New Deal? I quote from a history lesson.<sup>3</sup>

Roosevelt delivered one speech at the Commonwealth Club in San Francisco, however, which did generally foreshadow the new tack that was to be taken under the New Deal. In this address Roosevelt clearly set down the thesis that the nation had arrived at a great watershed in its development. Popular government and a wide continent to exploit had given the United States an unusually favored early history, he asserted. Then the Industrial Revolution had brought a promise of abundance for all. But its productive capacity had been controlled by ruthless and wasteful men. Possessing free land and a growing population, and needing industrial plant, the country had been willing to pay the price of the accomplishments of the "ambitious man" and had offered him "unlimited reward provided only that he produced the economic plant so much desired." ...

Our industrial plant is built; the problem just now is whether under existing conditions it is not overbuilt. Our last frontier has long since been reached, and there is practically no more free land.

...  
Clearly, all this calls for a re-appraisal of values. A mere builder of more industrial plants, a creator of more railroad systems, an organizer of more corporations, is as likely to be a danger as a help. The day of the great promoter or the financial Titan, to whom we granted anything if only he would build, or develop, is over. Our task now is not discovery or exploitation of natural resources, or necessarily producing more goods. It is the soberer, less dramatic business of administering resources and plants already in hand.

I am wondering if the introduction of BPL technology is not also "a great watershed," letting the genie out of the bottle. We don't have much HF or low VHF spectrum that somebody isn't using, just as in 1932 "there [was] practically no more free land." There are already several platforms that can deliver broadband service, and one may question if adding BPL produces a service that "is not overbuilt"? The "Industrial Revolution had brought a promise of abundance for all," just as "President Bush established the bold goal of universal and affordable broadband access for every American by 2007" (NTIA). A problem had occurred when America's "productive capacity had been controlled by ruthless and wasteful men," where "needing industrial plant, the country had been willing to pay the price of the accomplishments of the 'ambitious man' and had offered him

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<sup>3</sup> Stephen B. Oates, UNIV. OF MASS., AMHERST, Portrait of America, Vol. II (Boston: Houghton Mifflin Co., 1973) pp. 277-8.

'unlimited reward provided only that he produced the economic plant so much desired.'" Are we perhaps not now confronted with a breed of ruthless and wasteful BPL providers to whom we are about to make unlimited concessions provided they produce the broadband service so desired? These are legitimate questions.

Let's look at an example of "ruthless and wasteful men." I'll take one from fiction so I don't step on anyone's toes.

"Look, I worked on Hartex for a year. I talked to people who lost their shirts. There wasn't a week I didn't have some ruined life haunting my office like Hamlet's father. I told them we would help. Then I go on vacation for a week. I call in last Thursday and discover you've settled the case. While I'm gone, the Hartex people send down a Wall Street type, the one who used to be Deputy Secretary of State. He tells you how much he respects you, and how a lot of trouble can be saved. In return for no jail, he agrees to an injunction promising that his clients will never swindle anyone again. They don't need to, because they've just waltzed into affluent retirement. And we issue a press release that makes this out as the biggest coup since Tricky Dick turned back into a pumpkin. I tell you, Joe, the way we play the game is really amazing."

McGuire's eyes were stupid with surprise. He slowly turned to look out at the Capitol, as if calling upon it for support. Apparently, he got it. He pivoted with an expression of righteous contempt. "Look, I don't run this place just to please you. Every year I have to justify my budget to the commission and Congress—show them I close my cases. How do you think I've gotten here?" Now McGuire was shouting; each word thrust him out over the table toward me. Somehow I thought of an earthmover. "I can't let you get tied up on a frigging crusade. Your job is to question witnesses and get me the facts, not make policy. So if I don't have time to consult with you that's tough shit."

McGuire's face was attractive red. Feiner had the bleak satisfied look of a Jesuit who had rooted out a heresy. But disillusion pushed me on. "The Hartex people should have been indicted, prosecuted, and jailed. And we could have helped get some money back. Instead, our settlement shafted the stockholders. The only places it will ever look good are in our press releases and reports to Congress. Both of which are unadulterated bullshit."

McGuire smashed his palm on the table like a murderer squashing a fly. Feiner winced as if he were the next fly. He was all caged tension with nowhere to go. McGuire stared at the dead invisible fly, then at me. "I don't get this crap from the other guys." Feiner nodded on behalf of the other guys.

I shrugged. "They're not my problem, Joe."

"So what makes you so courageous?" This was half inquiry, half sarcasm.

"Because I have to live with myself."<sup>4</sup>

Securities fraud can cost people their shirts. Widespread implementation of BPL can devastate the HF to low VHF spectrum. That's wasting someone's money and someone's spectrum. Now look at ruthless. There is no penalty and no recovery. A slick suit makes an agreement with a promise not to swindle again. Big deal; they've entered retirement with what they got and the stockholders will never recover. That's being ruthless.

But isn't it the same with BPL's no interference clause? BPL industry is sitting pretty with use of all of 2 to 80 MHz allowed, under emission limits that were never intended for such a full time widespread source, they have to keep some industry record who knows where it is and how up to date, they're to have some frequency agility and power output management to mitigate interference problems, and they are subject to the "no harmful interference" clause. Once that goes through in that form, the ruthless BPL 'ambitious man' is set. He started by saying there would not be any interference when any competent engineer would know there would be. Then in a test site when a mobile amateur complains of harmful interference, the slick lawyer says it's not harmful because he'll be out from under it in a couple miles. Such a noninterference clause is like the no-more-swindling agreement the retirees signed. It's too late to do those harmed any good.

The immigrant who wants to listen in to the old country on an inexpensive shortwave receiver he's just bought will not know why he can't receive it because the BPL providers were not required to disclose this possibility in their advertising or send notice of it with the utility bill. The amateur radio operator who hears what sounds like BPL interference will have a hard time tracking it to its exact source because there was no provision in the rules for BPL signals to carry readable i.d. tags in their transmissions. And the ham that does track them down can be given the runaround, told by the BPL lawyer that the interference is not *harmful* when it would be too much trouble or impossible for them to cure. The FCC is too understaffed for the workload that BPL interference complaints produce, so the BPL companies won't sweat it. Rather than trying to give radio users some spectrum back, the FCC will have allowed wasteful and ruthless men to have everything they wanted.

To bring FDR up to date, "Clearly, all this calls for a re-appraisal of values. A mere builder of more industrial plants, a creator of more railroad systems, an organizer of more corporations, [a supplier of a new broadband platform], is as likely to be a danger as a help. The day of the great promoter or the financial Titan, to whom we granted anything if only he would build, or develop, is over. Our task now is not discovery or exploitation of natural resources [radio spectrum], or necessarily producing more goods [platforms]. It is the soberer, less dramatic business of administering resources and plants already in hand.

How did we end up with Bush's speech so far off the mark of FDR's? Coincidentally on the same day of Bush's speech, the April 26, 2004 issue of *Time* magazine had a feature giving a synopsis of each of 100 Leaders & Revolutionaries beginning with:

**George W. Bush**

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<sup>4</sup> Richard North Patterson, The Lasko Tangent (New York: Ballantine Books, 1980) pp. 14-15.

### Radical Gambler

O The truism about the President is that he is steady, clear, reliable, someone who knows what he believes and sticks with what he knows. The truth about him is more perplexing. He campaigned as a bipartisan conciliator; yet under his presidency, the U.S. has become even more culturally and politically bifurcated. He promised a foreign policy based on humility and contempt for nation building; but his Administration has embarked on the most ambitious nation-building project since World War II.

He pledged centrist, inclusive conservatism, and yet he has supported a constitutional amendment to ban gay marriage and has courted the religious right. He was touted as a fiscal conservative, but he has hugely expanded federal government.

For all this, he is both loved and reviled. He is loved for his undeniable charm, good humor and geniality. He is reviled for excessive rigidity, indifference to those outside his political orbit and lack of reflection and curiosity.

President Bush is described under the rubric: Radical Gambler. BPL is nothing if not radical, sending rf over lines designed for 60 cps. That differs from the tone or your NPRM describing BPL systems as "properly designed and operated" (FCC 04-29, ¶ 37) when it is a radical not a proper design to send HF to low VHF over a line designed for 60 cps. That BPL is a gamble is easy to demonstrate. Just look at what happened when it was tried in Japan, the Netherlands, Austria and elsewhere. It got banned because of interference.

The parts of the speech I left off do show Bush to be quite the genial fellow, joking and playing the audience. The article got that right. Are there any negatives?

"He is reviled for excessive rigidity" (*Time*). He says, "We need more than just one provider available ... In our society, the more providers there are, the better the quality will be and the better the pricing mechanism will be. ... fiberoptic cables ... high-speed communication directly over power lines ... wireless broadband." He doesn't give a broad enough spectrum of providers already available. Even the NPRM mentions "existing broadband services, such as cable and DSL" (FCC 04-29, ¶ 30) which didn't get included in the president's speech. If all the current platforms had been enumerated, the addition of BPL might have seemed more like overbuilding.

Secondly, "he is reviled for ... indifference to those outside his political orbit" (*Time*). It is lamentable how the BPL process got going by leaving off the radio spectrum users who would be most negatively affected by it. The BPL companies themselves do not include links on their websites to those dealing with interference problems, they didn't invite hams and the ARRL to their test trials when they started, and they informed FCC officials right off the bat that there simply wouldn't be any interference problems. All these rf spectrum users were left out of the loop, and Bush relies on his advisors for speech material.

Thirdly, "he is reviled for ... lack of reflection and curiosity" (*Time*). Did he have

time as a busy president to reflect on *why* a.c. power lines aren't designed for broadband technology, or have the curiosity to enquire how they might behave when we try to use them that way? Probably not.

So when we come to a watershed similar to FDR's when, "Our task now is not discovery or exploitation of natural resources [radio spectrum], or necessarily producing more goods [platforms]; it is the soberer, less dramatic business of administering resources and plants already in hand," but we have a president who is a radical gambler with a too narrow view on options already available, who has not been fully briefed on the near certain pitfalls of BPL, and who doesn't have the scientific curiosity or time to figure it out for himself, such a speech gung-ho for BPL is what we might expect.

In an irony worthy of a great writer, Bush's speeches have one similarity to that of FDR: FDR's speech was a precursor of the New Deal, and when we hear Bush, we can expect new deals in the future too. "He campaigned as a bipartisan conciliator; yet under his presidency, the U.S. has become even more culturally and politically bifurcated. He promised a foreign policy based on humility and contempt for nation building; but his Administration has embarked on the most ambitious nation-building project since World War II. He pledged centrist, inclusive conservatism, and yet he has supported a constitutional amendment to ban gay marriage and has courted the religious right. He was touted as a fiscal conservative, but he has hugely expanded federal government" (*Time*). He gives a speech in 2004 promoting a broadband Nirvana by 2007; in 2007 we may well end up in a new deal of radio Purgatory if the FCC doesn't stop its full speed ahead course. You'd be doing us a favor to stop BPL implementation.

Oh, how soon we forget! At the very least you'd be preventing a nuisance to HF operations by not allowing deployment of BPL, and the very principle you could use — — though in a different application — — was established in a case you *won* before the highest Court: *FCC v. Pacifica Foundation*,<sup>5</sup> "As Mr. Justice Sutherland wrote, a 'nuisance may be merely a right thing in the wrong place — — like a pig in the parlor instead of the barnyard.' *Euclid v. Amber Realty Co.*, 272 U.S. 465, 388." Broadband is definitely the right thing, but through power lines it's in the wrong place. If I'm understanding NTIA's cover letter correctly, BPL is "another of the most difficult spectrum challenges" precisely because it's a hog for spectrum usage in the HF to low VHF range whose over-the-air users have some sensitive requirements — — a pig in the parlor. Some of such current spectrum users, you yourself recognize as "likely to present a difficult challenge in the deployment of BPL" (**FCC 04-29, ¶ 35**), the same pig in the same parlor. You'd be justified in prohibiting it, although sent through *shielded* cable it would be in its appropriate environment, the right place.

Okay, suppose the ball is rolling and there is no way to turn it back. Even presidents with backbone, who get what they want, still make concessions. Have we forgotten the Cuban missile crisis too? "Even though they took the missiles out, Khrushchev forced Kennedy to promise to leave us alone. That was all we wanted anyway."<sup>6</sup> Suppose you were allergic to a pet your wife or husband insisted on keeping.

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<sup>5</sup> 98 S. Ct. 3026 (1978)

<sup>6</sup> John Blackthorn, *Sins of the Fathers* (New York: William Morrow & Co., 1999) p. 13.



You are very sensitive to tiny emanations from it. You would have every right to keep the pig out of the parlor. But if your spouse insisted and you felt you had to give in, you would make some stipulations he'd have to agree to. There would be compromises on the other's part in order for you to permit it at all. You bet there would be. Let's see how much we can use this analogy.

**Housekeeping to Reduce Pet Allergens and Their Effects<sup>7</sup>**

If you or someone else in the home is allergic to a pet and you are unwilling to give the pet up, specific measures can help reduce the level of allergens in the house. Such reductions can translate into greater comfort and fewer symptoms for the allergic. The major remedy, strongly recommended by all allergists, is that you *keep the pet out of the bedroom at all times*, which means, most important of all, *off the bed*.

Keeping the pet off the bed would correspond to the "part of NTIA's proposed solution ... to protect 41 frequencies for the most sensitive and likely most severely affected federal systems. Protecting these frequencies, which represent less than 6 percent of the frequency capacity of BPL systems, will go a long way toward addressing potentially serious interference concerns." That's the highly recommended keeping the pet off the bed.

There is also the bedroom itself to consider, an additional buffer zone. Federal system frequencies are not the only ones that need this protection. Let's start with amateur frequencies in the 2-80 MHz range.

PUBLIC LAW 103-408 [S.J. Res. 90]; October 22, 1994

...

Now, therefore be it Resolved by the Senate and House of Representatives of the United States of America in Congress assembled,

SECTION 1 FINDINGS AND DECLARATIONS OF CONGRESS.

Congress finds and declares that--

- (1) radio amateurs are hereby commended for their contributions to technical progress in electronics, and for their emergency radio communications in times of disaster;
- (2) the Federal Communications Commission is urged to continue and enhance the development of the amateur radio service as a public benefit by adopting rules and regulations which encourage the use of new technologies within the amateur radio service; and

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<sup>7</sup> Cheryl Mendelson, Home Comforts The Art and Science of Keeping House (New York: Scribner, 1999) p. 640.

(3) reasonable accommodation should be made for the effective operation of amateur radio from residences, private vehicles and public areas, and that regulation at all levels of government should facilitate and encourage amateur radio operation as a public benefit.

Approved October 22, 1994

Taking the declarations one at a time, (1) that radio amateurs are commended for their technical expertise flies in the face of comments from BPL companies that the amateurs' assertion "that the power lines will act as efficient antennas and pollute their surroundings with harmful interference is not supported by scientific measurements" (FCC 04-29, ¶ 23). The NTIA study supports the amateurs' assertion, whose expertise had already been supported in law.

Furthermore, the same law commends amateurs "for their emergency radio communications in times of disaster," and Presidential Decision Directive-63 (PDD-63) states that "All critical infrastructure protection plans and actions shall take into consideration the needs, activities and responsibilities of ... first responders." This cooperation was to be part of a scheme in place not later than five years from the day the president signed PDD-63, which would make it May 22, 2003, shortly after your NOI 03-104 came out. Virtually all the comments from BPL companies were submitted after that date, and they seemed to show a sad lack of cooperation.

Let's look at declaration (2). The FCC is to "encourage the use of new technologies within the amateur radio service." I notice that Commissioner Adelstein's statement attached to NOI 03-104 is that he "believe[s] that we need to push the boundaries to accommodate new technologies," and then he refers to the pertinent provision of the Communications Act, Section 157. Okay, let's look within the amateur rules, § 97.3 Definitions, (a) (21)

***Harmful interference. Interference which ... seriously degrades, obstructs or repeatedly interrupts a radiocommunication service operating in accordance with the Radio Regulations.***

That is what BPL would do to amateur communications in spades, as you seem to be aware of, "We recognize that amateur operations are likely to present a difficult challenge ..." (FCC 04-29, ¶ 35). There are new technologies that prevent such harmful interference. The old technology is unbalanced (at rf frequencies) wires (a.c. power lines) used as transmission lines at HF+ frequencies. New technologies would include shielded coaxial cable, and even fiber optics which you seem to lightly brush aside (FCC 04-29, ¶ 15). I know I'm stretching a point on a rule application, but I'm not stretching it very far. I believe the FCC should promote cable and other shielded forms of sending broadband rather than on unshielded unbalanced wires.

So you've more or less got two strikes already against BPL when we get to declaration (3) "reasonable accommodation should be made for the effective operation of amateur radio from residences, private vehicles and public areas, ..." Okay, what's to be considered "reasonable accommodation"? We are thankful for NTIA's Report 04-413 with

its cover letter of April 27, that lists "Other reasonable mitigation techniques suggested in the NTIA Report ..." Other reasonable mitigation techniques. Before the list of the *other* ones, what was the *first* one? Oh yes, keeping the pig out of that bed. If a primary reasonable mitigation technique was to protect certain frequencies, and reasonable accommodation is to be made to amateurs— —PUBLIC LAW 103-408 [S.J. Res. 90], declaration (3)— —, then sensitive amateur frequencies need to be protected too. In the 2 to 80 MHz range that would be the harmonically related 80, 40, 20, 15, and 10 meter bands, and possibly six meters as well.

I point out that "reasonable accommodation [is] made for the effective operation of amateur radio from residences" already by HomePlug.

CSD December 2000: Feature

### **HomePlug Standard Brings Networking to the Home<sup>8</sup>**

By Steve Gardner<sup>9</sup>, Brian Markwalter<sup>10</sup>, and Larry Yonge<sup>11</sup>.

The HomePlug PHY occupies the band from about 4.5 to 21 MHz. The PHY includes reduced transmitter power spectral density in the amateur radio bands to minimize the risk of radiated energy from the power line interfering with these systems.

Furthermore, you accepted this standard of reasonable accommodation in the NOI saying "that joint testing by the ARRL and HomePlug has demonstrated a very low probability of interference between its devices and amateur radio use<sup>12</sup>" (FCC 04-29, ¶ 21). If you apply that standard to mobile operations as required by PUBLIC LAW 103-408, then Access BPL using lines adjacent to roads travelled by hams need to likewise "include reduced transmitter power spectral density in the amateur radio bands to minimize the risk of radiated energy from the power line interfering with these systems."

I haven't yet mentioned shortwave broadcasting which has its own treaty obligations the FCC should be honoring. ITU Radio Regulation 4.11 reads: "Member States recognize that among frequencies which have long-distance propagation characteristics,

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<sup>8</sup> Copyright © 2003 CMP Media LLC, The complete May 2003 issue of *Communication Systems Design* magazine is live on [CommsDesign.com](http://CommsDesign.com).

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<sup>12</sup> See comments of HomePlug at 5. See also, HomePlug & ARRL Joint Test Report, January 24, 2001, <[http://www.arrl.org/tis/info/HTML/plc/files/HomePlug\\_ARRL\\_Dec\\_2000.pdf](http://www.arrl.org/tis/info/HTML/plc/files/HomePlug_ARRL_Dec_2000.pdf)>.

those in the bands between 5 and 30 MHz are particularly useful for long-distance communications; they agree to make every possible effort to reserve these bands for such communications. Whenever frequencies in these bands are used for short-range or medium-distance communications, the minimum power necessary shall be employed." ITU Radio Regulation 15.12 reads, "Administrations shall take all practicable and necessary steps to ensure that the operation of electrical apparatus or installations of any kind, including power and telecommunication distribution networks, but excluding equipment used for industrial, scientific and medical applications, does not cause harmful interference to a radiocommunication service and, in particular, to a radionavigation or any other safety service operating in accordance with the provisions of these Regulations." ITU regulations allocate certain frequencies between 2 and 26 megahertz for the exclusive use of international broadcasters.

You would probably need to ban BPL from some or all of these bands. Let's say for the sake of argument you agreed to ban BPL from the popular 49 meter broadcast band and that was all you were willing to do for them.

There might be other frequencies you'd want to or need to ban BPL from. Let's say the emergency channel 9 on the citizen's band. At any rate, the NTIA report defines the bed that pig is to stay out of, and you have other rules and considerations to define banned access to the bedroom, certain other frequencies or bands.

Back to the analogy:

Keep the bedroom door closed so that pet allergens cannot waft in and pets cannot stroll in. Close off any air ducts in the bedroom so that pet allergens cannot enter through these.

You might even try keeping the pet in only one or two rooms of the house. This is easy enough to accomplish with mice, guinea pigs, and hamsters but seems unkind with dogs and cats (and rather defeats the purpose of having one).<sup>13</sup>

NTIA recommends "interference absorbing filters." They want filters placed at the end of BPL runs to prevent the signal from traveling farther down the line past the place it is actually being used. Like barring the bedroom door to prevent the pig from entering. This method may not be able to restrict a broadband signal to a single house or two, except in the case of in-house BPL, not without defeating the purpose of sending signals this way, but it will help.

Moreover, there are studies showing that although keeping pets in limited areas may reduce allergens in the closed-off rooms, it will not keep allergens out altogether. In one study, although a cat was confined to one room and the door to the room was opened only once a day, cat allergens were nonetheless found throughout the house. Still, reducing the level of allergens in the pet-free rooms can be a major help to the allergic.<sup>14</sup>

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<sup>13</sup> Mendelson

<sup>14</sup> Ibid.

Even restricting BPL to certain frequencies and certain neighborhoods does not mean that it will be contained. BPL will generate harmonics because of its harsh waveform, and both harmonics and spurious mixing products because of nonlinearities in corroded power line junctions, so it can pop up at all kinds of frequencies. Furthermore, it can radiate by skip. For these reasons and others, BPL signals should be made to carry some kind of recognizable i.d. tag.

If you have a pet, you need to vacuum and dust more often and more thoroughly than other people to keep hair, dander, and airborne allergen concentrations at minimal levels. Vacuuming with a low-emissions vacuum fitted with a HEPA (High Efficiency Particulate Air) filter and dusting with a slightly dampened cloth are extremely important.<sup>15</sup>

As BPL *deliberately* puts lots of signals into radiating wires, measurements of radiated fields should be done *stringently*. No halfway measures. That means taking readings at *each* location where BPL is used— —as no two locations will be set up the same— —at a variety of heights and distances along the line, certifiably correct. No extrapolating from a shorter range unless the standard distance is truly inaccessible. Companies will fudge at this to get usable readings when the standard method doesn't do the trick.

In households in which anyone has a serious allergic response, such as asthma, to a pet, daily vacuuming with a low-emissions vacuum cleaner and daily dusting are desirable. But since most people cannot manage daily dusting and vacuuming, the recommendation has to be to do these *frequently*—as often as you possibly can.<sup>16</sup>

Since BPL cannot work if it had to stay off every frequency someone might use where it might interfere, there needs to be some management scheme to do everything possible to avoid interference. That means intelligent power management, where because of the two-way BPL "handshake" feedback is given to reduce power level to just enough to get by. Also agile frequency change in a dynamic interference setting. That means local registration, and a web-based interface to report interference problems. Not everybody has internet access— —especially some old timer amateur radio ops— —, but since the Telecommunications Act of 1996, most people have telephones, so I believe a telephone hot-line through one's power company should also be required.

Respectfully Submitted,  
Earl S. Gosnell III

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<sup>15</sup> Ibid.

<sup>16</sup> Ibid.