Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554

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

To: The Commission

REPLY COMMENTS OF
SOUTHERN LINC,
SOUTHERN TELECOM, INC., AND
SOUTHERN COMPANY SERVICES, INC.

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EXECUTIVE SUMMARY

The Comments in this proceeding demonstrate significant support for the benefits that could be provided by Access Broadband over Power Line ("Access BPL") systems provided the initial technical regulations are not so onerous as to discourage investment in this nascent technology. BPL offers the potential for broadband access to unserved and underserved areas as well as a number of benefits in utility control and automation. Southern also agrees with NTIA's observation that ambient noise from electric power lines will likely be reduced through the introduction of BPL due to the extra measures that many BPL operators will employ to improve the efficiency of the BPL systems by minimizing line noise.

A centralized database of BPL installations could provide certain benefits in helping to identify points-of-contact at BPL operators. Such a database should not be used, however, to collect and make public data that could jeopardize the security of the power grid by essentially mapping a utility's infrastructure. Moreover, it should not be a mechanism that competitively disadvantages BPL providers by revealing their commercially sensitive information when similar public disclosures are not required of other broadband providers. A database which indicates the Zip Codes in which BPL has been deployed, together with contact information, would help a licensed user determine whether BPL is a potential source of interference in the area as well as providing the licensee with contact information so that a direct request for assistance can be made to the BPL operator.

A number of commenters joined Southern in recommending that the definition of Access BPL be revised so that it does not inadvertently apply to Power Line Carrier

(PLC) on high voltage lines or to In-House BPL systems. Southern renews its recommendation that the definition also recognize the need for utility control over devices to be installed onto energized power lines or in the electric supply space due to significant safety and reliability concerns.

The limited number of interference complaints regarding Access BPL systems that have been operating under the existing Part 15 emissions limits presents strong evidence that the existing limits are appropriate starting points for Access BPL. Although a number of parties have expressed concern about the potential for interference, these concerns are largely unsupported and, in some cases, appear designed solely to derail Access BPL in order to foreclose competition in the broadband services market. A number of these commenters have even proposed mitigation measures that would eviscerate BPL as a viable technology and a competitive service on the pretext that these systems may not create even the *possibility* of interference. However, the emission limits in Part 15 regulations are intended to reduce the *probability* of harmful interference not the very potential for interference.

Southern and a number of other commenters reject the notion that specific mitigation techniques must be mandated for all Access BPL equipment. NTIA, among other commenting parties, notes that Access BPL operators will have a strong commercial incentive to prevent and eliminate harmful interference due to the non-interference conditions associated with this Part 15 service. Some of the recommendations by the opponents of BPL, such as immediate shut-down of transmitters upon receipt of an interference complaint, go beyond what is expected of any other Part 15 service. It is also uneconomic to incorporate specific mitigation technique in each

BPL device when these techniques may be totally unnecessary for the device in question; *e.g.*, devices installed in underground electric distribution systems. NTIA, for example, has suggested a number of mitigation techniques that could be included in the BPL operator's "toolbox." However, it would be inappropriate and unreasonable to mandate use of any particular technique.

Southern strongly opposes NTIA's recommendation that FCC equipment authorization should be obtained by each BPL operator as a pre-condition to operating. Such a requirement would effectively convert BPL into a licensed service without any of the benefits associated with licensing. Moreover, by relieving manufacturers of the obligation to test devices for compliance with the Commission's rules, the Commission would be limiting its enforcement options if particular devices are found to be generally non-compliant.

Southern supports the Commission's proposal to allow emissions measurements near the ground and notes that NTIA has endorsed such an approach after initially recommending measurements at or above the height of the power line. Southern disagrees with NTIA's recommendation, though, that there be a "comprehensive search" for peak field strength along key segments of the power lines. Southern's testing thus far indicates that the highest field strengths are located very near the BPL signal injection point. Similarly, Southern disagrees with the recommendation that measurements be taken sequentially across the entire frequency range over which the BPL device could operate. This approach will needlessly increase the costs of compliance without a substantial showing that alternative measurement techniques (*e.g.*, measuring a select number of frequencies across the range of the device) would not yield comparable results.

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SOUTHERN LINC,
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AND SOUTHERN COMPANY SERVICES, INC.

Pursuant to Section 1.415 of the FCC's Rules, Southern Communications Services, Inc. d/b/a Southern LINC, Southern Telecom, Inc., and Southern Company Services, Inc. (collectively referred to herein as "Southern") hereby submit their Reply Comments on the FCC's *Notice of Proposed Rule Making* in the above-captioned matter.[1] Through this *NPRM*, the FCC has proposed rules and guidelines for the development of Broadband over Power Line ("BPL") systems, which are new types of carrier current

[1] In re Inquiry Regarding Carrier Current Systems, including Broadband over Power Line Systems, Amendment of Part 15 regarding new requirements and measurement guidelines for Access Broadband over Power Line Systems ET Docket Nos. 03-104 and 04-37, *Notice of Proposed Rule Making*, 19 FCC Rcd 3335 (2004) *("NPRM")*. Pursuant to Public Notice, DA 04-760, released March 23, 2004, these Reply Comments are submitted for filing only in ET Docket No. 04-37. The Reply Comment deadline was extended to June 22, 2004, by Order Granting Extension of Time, DA 04-1552, released May 28, 2004.

systems, operated under Part 15 of the FCC's Rules, that use existing electric power lines to provide broadband communications services.

I. THERE IS BROAD AND GROWING SUPPORT FOR ACCESS BPL

The comments indicate growing interest in Access BPL, both from the utility industry and from others who recognize the obvious competitive benefits that could flow from BPL deployment, particularly in unserved and underserved areas.

A. Utilities are Looking Forward to the Benefits BPL Can Provide in Electric System Control and Automation

A number of parties agreed with the Commission's observation that Access BPL could "allow electric utilities to improve the safety and efficiency of the electric power distribution system and also further our national homeland security by protecting this vital element of the U.S. critical infrastructure."[2] In its Comments, Southern described a number of applications that could be supported by Access BPL, including remote control and monitoring of line devices, power quality monitoring, automated meter reading, automatic connect and disconnect of customer service locations, system security, and Voice over IP.[3]

Cinergy and Hawaiian Electric (HECO) also noted the potential for Access BPL to enable a variety of Enhanced Power Distribution Service ("EPDS") operations.[4] As Cinergy explained, EPDS applications could include automatic outage detection and confirmation, remote monitoring and operation of switches and transformers, more

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[2] *NPRM* at para. 30.

[3] Southern at 4-6.

[4] Hawaiian Electric Company (HECO) at 2, and Cinergy at 2.

efficient demand-side management programs, and power quality monitoring to detect faulty components before they fail.[5]

Southern strongly disagrees with the Disaster Emergency Response Association (DERA) that the presence of BPL systems on electric power systems will complicate restoration of electric service. DERA posits that the added complexity of repairing Access BPL systems associated with power lines "can do nothing to expedite repair of electric utility lines following a disaster," and that "[r]esources being finite, the utility company will have to choose between a faster electricity-only restoration or a slower electricity plus BPL restoration." In reality, the choice is self-evident: electric utilities have a public service obligation to provide electric service and to restore that service as quickly as possible under any circumstances. As a heavily regulated public service company, a utility would devote its finite resources to the restoration of electric service. Access BPL service cannot be restored until electric service is restored. DERA's objections are therefore totally unfounded.

Southern agrees with the National Telecommunications and Information Administration (NTIA) that there may be overall reductions in power line noise as an ancillary benefit of BPL.[6] Southern's experience with BPL confirms that for optimum data transmission efficiency, noise on the power line should be reduced as much as possible. As NTIA points out, in the long-term Access BPL will improve the reliability of the electric power distribution system and increase the likelihood that problematic power line noise will be diagnosed and repaired, thereby reducing the noise floor across a broader range of frequencies than just those used by the BPL system itself.

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[5] Cinergy at 2.

[6] NTIA at 4-5.

B. BPL Offers Potential for Broadband Access to Unserved and Underserved Areas

A number of parties – including parties who are opposed to the deployment of BPL in certain frequency bands – acknowledge that Access BPL could provide significant public interest benefits in expanding access to broadband services, particularly in unserved and underserved areas. For example, AT&T has asserted that "BPL promises to help end [the cable-DSL] duopoly and bring the benefits of robust broadband competition to millions of customers."[7] AT&T is encouraged that once BPL is deployed commercially, it could provide a platform for Voice over Internet Protocol (VoIP) so that "VoIP providers may offer a facilities-based voice alternative to the Bell local exchange monopoly."[8] BellSouth also notes that "provision of broadband service over power lines (BPL) is yet one more competitive entry into the broadband market" and that it "strongly favors competition in this ever-increasing and necessary part of our economy."[9]

Competitive local exchange carriers (CLECs) also welcome the advent of BPL. LecStar reported that it is evaluating BPL as a potential alternative access method to the incumbent local exchange carrier (ILEC) and third-party DSL infrastructures where economically feasible.[10] LecStar believes BPL could provide a cost-effective access alternative to the "high cost, poor service and contentious legal and regulatory environment associated with using an ILEC as the monopoly access vendor."[11]

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[7] AT&T at 3.

[8] *Id.*

[9] BellSouth at 2.

[10] LecStar at 3.

[11] *Id.*

In short, there is ample evidence in the record on which the Commission may base a finding of the significant public interest benefits that could be achieved through widespread deployment of BPL. It is therefore appropriate for the Commission to adopt rules on BPL that are narrowly tailored and that will not unduly hinder the cost-effective development of this new technology. Indeed, Section 7 of the Communications Act encourages the development of new communications technologies and services and sets a high hurdle for those who would seek to block new technologies and services such as Access BPL:

> (a) It shall be the policy of the United States to encourage the provision of new technologies and services to the public. Any person or party (other than the Commission) who opposes a new technology or service proposed to be permitted under this chapter shall have the burden to demonstrate that such proposal is inconsistent with the public interest.
>
> (b) The Commission shall determine whether any new technology or service proposed in a petition or application is in the public interest within one year after such petition or application is filed. If the Commission initiates its own proceeding for a new technology or service, such proceeding shall be completed within 12 months after it is initiated.

Thus, as it develops rules in this proceeding, the Commission must weigh the public interest benefits offered by BPL against the claims of those who would stifle this technology before it even has a chance to advance beyond the experimental stage.

II. ANY DATABASE OF BPL INSTALLATIONS MUST NOT REQUIRE DISCLOSURE OF SENSITIVE INFORMATION

In the *NPRM*, the Commission proposed adoption of a notification requirement similar to the notification requirement currently in the rules for power line carrier (PLC) systems.[12] The Commission stated that the purpose of this notification requirement

[12] *NPRM* at para. 43.

would be to "establish a publicly accessible database for Access BPL information to ensure that the location of Access BPL systems and their operating characteristics are identified if harmful interference occurs and to facilitate mitigation and avoidance measures." The *NPRM* proposed that notification include "the location of the installation, the type of modulation used and the frequency bands of operation."

While the opponents of BPL have recommended additional conditions associated with this notification proposal, a number of parties joined Southern in suggesting ways in which such a notification activity could balance the public's need for assistance in identifying points of contact at BPL operators and the BPL operators' need to protect sensitive operational and competitive information.

A. There are Significant Risks in Making Such a Database Publicly Accessible

Virtually all utilities commenting in this proceeding noted the serious risks involved in requiring them to place sensitive operational information in a publicly accessible database. These parties have raised a number of reasons why any such database requirement must be carefully structured so that the limited benefits of such a database are not outweighed by the far greater threat to Homeland Security and the maintenance of reliable electric service.

Parties have raised the following factors as militating against a notification requirement or at least for limiting the amount of data and level of detail that must be provided:

1. Homeland Security and Protection of Critical Infrastructure Information

By far, utilities expressed greatest concern that a central database of BPL equipment locations could jeopardize Homeland Security by allowing public access to Critical Infrastructure Information. Southern and Duke both noted that the Federal Energy Regulatory Commission (FERC) has adopted regulations designed to protect from routine public disclosure information filed with that agency about utilities' critical infrastructure.[13] Cinergy pointed at that a database or map of BPL equipment locations would, in essence, be a map of a utility's electric infrastructure, including indicators as to the location of transformers and other equipment.[14] As UPLC noted, utilities are particularly concerned about public disclosure of information that could be considered "protected critical infrastructure information" under the Homeland Security Act of 2002.[15] The Information Technology Industry Council (ITIC) suggested that, in light of present homeland security requirements, the Commission should carefully evaluate whether to give public access to the database, which would contain sensitive public infrastructure information.[16]

2. Competitive Issues

Public access to a database of BPL device locations would also raise competitive issues. While providers of BPL service have no incentive to "hide" where they provide service, it is also true that competitive broadband providers do not have to reveal the

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[13] Southern at 9; Duke at 8-10.

[14] Cinergy at 3.

[15] UPLC at 11.

[16] ITIC at 6.

precise location of every piece of operating equipment in their networks.[17] As AT&T noted, "[u]nfettered access to such a database would allow the entrenched broadband providers to determine when and where introduction of competitive BPL services was planned."[18] AT&T joined the utilities in advocating for measures to protect BPL providers' confidential deployment plans if the Commission mandates creation of such a database. Similarly, Sprint expressed concern about the competitive consequences of posting information about a providers' network design in an industry database.[19]

3. Customer Privacy

PLCA raised the suggestion that a database notification requirement could also raise issues of customer privacy.[20] To the extent the database notification activity would include registration of the locations of BPL devices installed on, in or near customer locations, customers may balk at having the prospect of their home address and the presence of broadband equipment listed in such a publicly accessible database. While it is unclear whether the Commission is proposing to require identification of customer modems (which would appear to be defined as In-House BPL equipment), the point remains that customers may not wish to subscribe to a service knowing that equipment used to serve them is in a publicly accessible database.

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[17] PPL Telecom at 7, Cinergy at 3, Duke at 8-9,

[18] AT&T at 7.

[19] Sprint at 4.

[20] PLCA at 3.

4. Potential Damage to Equipment

PPL raises the potential for a publicly accessible database to make it easier for malefactors to damage BPL equipment by providing them with specific locations where such equipment may be found.[21] Given the open hostility to BPL expressed by many of the commenters in this proceeding as well as in other public fora, it would not be difficult to imagine certain individuals using such publicly available information to damage BPL equipment in an effort to slow its deployment or to harm the overall reputation of BPL as a reliable communications platform. In this regard, damage may not be limited to physical damage to the BPL equipment but could include intentional "jamming" of BPL equipment by locating higher power transmitters near operating BPL devices. It is one thing for a database to be used as a means of identifying potential interference situations; it is another thing entirely if such a database could be used to create interference situations that otherwise would not have existed.

5. Meritless Interference Complaints

A few commenters express concern that a publicly accessible database could lead to specious "interference" complaints by parties intent on hindering BPL deployment. This concern is particularly acute to the extent the Commission has proposed requiring disclosure of planned BPL deployment locations. As noted by PLCA, such disclosures would invite pre-construction protests from parties wishing to prevent deployment of Access BPL in their neighborhoods or from competitors also wishing to prevent deployment.[22] Similarly, Ameren expressed concern that a requirement for BPL

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[21] PPL at 7.

[22] PLCA at 4.

providers to file pre-construction deployment information will imply some form of right to protest such installations.[23]

Pre-construction notifications, together with some perceived obligation to respond and react to complaints engendered thereby, would effectively subject BPL to the preconstruction coordination obligations of a licensed service without any of the benefits. Because BPL is a Part 15 service subject to a non-interference condition, BPL operators have every incentive to design their systems in a manner that will minimize the potential for interference. Pre-construction notification on a publicly accessible database will not heighten this incentive. Instead, it will quite likely result in forcing BPL operators spending time and resources to respond to hypothetical interference disputes before devices are even deployed.

6. Database Costs

Finally, little attention has been paid to the potential costs associated with a detailed database notification requirement. A third-party must be compensated for its costs for maintaining and managing the database, and BPL operators will have to spend time and resources to keep their data current. These costs are in addition to those that BPL operators will incur in responding to real or perceived concerns about BPL "interference." Depending on the level of information required in the database and the specific requirements imposed on the third-party administrator to respond to queries or research potential interference cases, these costs could be substantial.[24] Similar costs are not imposed on BPL's existing competitors in the broadband marketplace, presenting a

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[23] Ameren at 10.

[24] Duke at 8-9.

significant potential competitive disadvantage for BPL operators, and the *NPRM* does not suggest how these costs would be covered.

B. A Central Database Might Present Minimal Assistance in Helping Licensees Identify BPL Operators

Even though maintenance of a central database is fraught with peril, a number of commenters noted that it might help licensees assess whether BPL might be a potential source of interference and would help them identify a point of contact at the BPL operator who can help in resolving any interference that can be attributed to BPL.[25] Given the extremely low power at which BPL systems operate, any interference from BPL is likely to be highly localized. The operator of a central database is unlikely to have an ability to investigate or resolve interference disputes without consulting the BPL operator itself. However, a central database could provide a convenient method for licensees to roughly determine whether BPL could be a source of interference, and if so, to identify a point of contact at the BPL operator.

Unlike all other Part 15 services, where the identity of the unlicensed device user can only be discovered through direct over-the-air monitoring and direction-finding, the operator of an Access BPL system will probably be well-known in the community. In addition, unless the area of interference is near the boundary between two electric utilities, it should not be too difficult for most licensees to identify the BPL operator for the area. Nevertheless, a centralized database could save licensees some time by directing them to a specific individual or office responsible for responding to BPL interference complaints.

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[25] BellSouth at 6-7, NCTA at 5, and UPLC at 10.

C. Commenters Have Offered Reasonable Parameters for a Central Database

Parties commenting on the notification database have suggested a number of reasonable parameters under which such a database should be operated:

1. Operated by a Trusted Third-Party

The entity selected to operate the database must be trusted by BPL operators as an organization that has nothing to gain through use of or exploitation of the data. In addition, the qualifications of the database manager and its duties will vary according to the amount and level of detail in the data it maintains. As noted by Current Technologies, one of the functions of the database manager would be to protect sensitive information from public disclosure.[26] Similarly, the National Rural Telecommunications Cooperative (NRTC) and the National Rural Electric Cooperative Association (NRECA) recommend that a neutral third-party administrator be selected.[27] Southern agrees and notes that the United Telecom Council (UTC) may be a logical choice given its long-standing maintenance of the PLC database which is used for similar purposes.

2. Only General Location Data Should Be Provided

Given the serious concerns with providing specific locations of all Access BPL devices, Southern renews its recommendation that the Commission only require BPL operators to identify the general areas in which they have installed BPL devices. Southern suggested that locations be given by reference to Zip Codes. It even posited the notion that a BPL operator could identify more Zip Codes than those in which it currently

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[26] Current Technologies at 22.

[27] NRTC/NRECA at 6.

provides BPL service as another means of protecting the precise location of its network yet still providing the public with information by which they could promptly contact the BPL operator with interference complaints.[28]

Other parties concurred that location data should be provided only at the Zip Code level.[29] Main.net suggested that location data be provided only at the macro level of City and/or Town.[30] NTIA recommended using a set of geographic coordinates and a radius around those coordinates to define BPL service areas.[31] Based on the Comments filed in this proceeding, Southern believes that location data referenced by Zip Code will adequately meet the needs of both licensed users in identifying the areas in which BPL devices are deployed as well as the needs of utilities in protecting sensitive operational and competitive information. While geographic coordinates might be useful to certain licensed users who already know the coordinates of their receiving equipment, Southern believes that use of Zip Codes would be easier for the casual listener to consult the database.

3. Limited Access to Data

Depending on the level of BPL system detail included in the database, Southern agrees with those commenters who recommend that access to the database should be restricted to licensed radio operators or other qualified entities (such as state or federal agencies) having a need to know.[32] Current Technologies also recommends that the

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[28] Southern at 10-12.

[29] Progress Energy at 7, and Duke at 9-10.

[30] Main.net at 7-8.

[31] NTIA at 11.

[32] Duke at 10.

database not be made available to the public.[33] As noted above, the number of restrictions that would have to be imposed on database management and access will be a function of the level of detail of the information included in the database.

4. BPL Contact Information

By far, the most important function that could be served by a central database would be the identification of a point of contact at the BPL operator who might have devices in the general vicinity of the inquiring party. Because of the variety of BPL devices, modulation schemes, frequency bands, and mitigation techniques, as well as the wide variety of licensed services operating in the bands which will likely be used for BPL, it is unrealistic to expect a centralized database to provide much in the way of a detailed "frequency coordination" or automated interference analysis. Even the report filed by NTIA indicates that a large number of variables would have to be considered in evaluating interference complaints as well as a wide range of options available to the BPL operator to address harmful interference that might arise.[34] Southern therefore strongly recommends that a centralized database, if required, only be used as a means of helping to identify the BPL operator who might have devices in the area of interference. Although Small Business in Telecommunications (SBT) has proposed that each BPL operator include a "hot link" from the BPL operator's website to the website for the centralized BPL database, Southern believes a more useful approach would be to include

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[33] Current Technologies at 3.

[34] *Potential Interference from Broadband over Power Line (BPL) Systems to Federal Government Radio Communications at 1.7 – 80 MHz – Phase 1 Study*, NTIA Report 04-413, published April 27, 2004 ("NTIA Phase 1 Report").

a link from the central database to the BPL operator's website that, in turn, could contain additional information on how to report an interference complaint.[35]

D. Some Proposed Requirements for a BPL Database Would Make it Unworkable and Ill-Advised

The opponents of BPL have suggested a number of conditions related to the database notification requirement which would needlessly complicate BPL deployment without any corresponding public benefit. For example, the Consumer Electronics Association (CEA) recommends that the database include the power spectral density mask of each BPL device, which it defines as the maximum power permitted by the system for any given frequency.[36] However, and as noted above, the centralized database cannot substitute for direct contact between the licensed user and the BPL operator. Even if a licensed user knew the power spectral density mask of the BPL system, it would be unlikely to lead to a more prompt resolution of the interference.

Southern strongly opposes SBT's recommendation that the centralized database include mapping software to show "the exact locations of the lines over which BPL is traveling."[37] Such a requirement would be in direct conflict with Homeland Security and protection of the nation's Critical Infrastructure. Southern agrees with SBT that "meets and bounds" would be an illogical way of depicting the general location of BPL systems, but Zip Codes are readily available, widely understood, and an easy method by which a national database could be queried. Southern also disagrees with SBT's suggestion that

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[35] SBT at 8.

[36] CEA at

[37] SBT at 8.

the central database advise users that BPL harmonics could be a source of interference.[38] Southern doubts that such information would serve any purpose other than to incite filing of complaints against BPL operators.

REC Networks has suggested that the database notification requirement should be comparable to the Network Disclosures that must be filed by ILECs about their facilities and that the disclosures must indicate a 24-hour "live" method to report interference.[39] The requirement for "live" in-take of interference complaints on a 24/7 basis is overbroad and might not be the most efficient. Southern suspects that some BPL operators may provide for electronic intake of interference complaints. In any event, micromanagement by the Commission of the methods BPL operators use to in-take interference complaints is unnecessary so long as they respond in a reasonable fashion. At present, no evidence even hints that BPL operators will be any less likely to respond to interference complaints than any other operator of a Part 15 device. Indeed, BPL operators have a stronger incentive to respond than other Part 15 users given the substantial investment they will be making in their networks.

Although NTIA has recommended that a licensed user should not bear any responsibility for diagnosing BPL interference, it has also recommended that a centralized national database include sufficient detail to "facilitate radio operator diagnosis of suspected interference from BPL systems."[40] Among the data elements NTIA would include in the database are the system's multiple access technique, modulation details (including modulation type, carrier spacing parameters and data rate

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[38] SBT at 10.

[39] REC Networks at 3.

[40] NTIA at 12.

on each carrier), method of power control, and the number of devices currently deployed and the maximum number of devices to be deployed in the specified area.[41] Some of this data would be considered proprietary (such as the number of actual and projected BPL devices), and a requirement to pre-publish such information in a publicly accessible database as a condition of operating a BPL system would effectively transform BPL into a licensed service without any of the customary benefits of licensing. No other Part 15 users are required to give public notice of comparable information, and BPL's broadband competitors are not required to make information about their deployments public, including in advance of such deployments occurring. Southern strongly opposes the public disclosure of the information requested by NTIA.

NTIA also suggests that BPL transmission of identification codes could facilitate identification of BPL emissions using conventional radio receivers.[42] Southern does not believe such a requirement would be practical, since any frequency selected for transmission of the identification code might not be among those transmitted from any particular BPL device. To be of practical use, the identification code would have to be transmitted in such a manner as to be available across the entire range of frequencies used by the BPL system. Southern would object to any such requirement if it would appreciably increase overhead and thereby decrease overall data throughput. Just overcoming the ambient noise on the power lines affects throughput, and adding additional overhead such as an identification code could make BPL an inefficient broadband service. Southern would also oppose such a requirement if it would increase the cost of BPL equipment itself or the cost of operating it. As noted elsewhere, a

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[41] *Id.*

[42] NTIA at 12.

requirement for transmission of what is effectively a "call sign" is one of the conditions normally associated with a licensed service, not the use of an unlicensed device such as BPL.

III. THE DEFINITION OF ACCESS BPL SHOULD BE CLARIFIED

A number of parties requested modification of the proposed definition of "Access BPL" in order to limit its potential application to other services.

A. The Definition Should Not Include Power Line Carrier (PLC)

Utility commenters noted that the proposed definition of Access BPL could inadvertently encompass existing "power line carrier" (PLC) systems.[43] PLC systems operate on frequencies below 1 MHz and are used by utilities to provide protection to the high voltage electric transmission lines. Southern can discern no intent by the Commission to reclassify PLC systems as "Access BPL," nor have any of the commenters recommended that PLC systems should be subject to the same rules as applicable to Access BPL.

Commenters have suggested two primary means by which the definition of Access BPL could be modified so as to exempt PLC: (1) the definition of Access BPL should state explicitly that Access BPL does not include PLC systems as defined in Section 15.3(t) of the Commission's Rules, and/or (2) Access BPL should be defined as using frequencies above 1.0 MHz.[44] Southern concurs with both of these recommendations. It renews its suggestion, though, that Access BPL be defined as using frequencies above 1.7 MHz because, to the best of Southern's knowledge, no BPL

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[43] Southern at 13, Duke at 5, UPLC at 4, Progress Energy at 2, and PPL Telecom at 3-4.
[44] *Id.*

equipment manufacturers are proposing to develop equipment that would operate in the AM broadcast band below 1.7 MHz.

B. The Definition Should Not Include In-House BPL

Similarly, the proposed definition of Access BPL could be construed as including In-House BPL systems -- for example, if BPL equipment is installed inside a building owned or controlled by an electric utility. The Commission has not proposed a definition of In-House BPL but has clearly indicated a distinction between these two types of systems. Southern therefore joins other commenters in recommending that the definition of Access BPL explicitly exclude "In-House BPL" systems from the definition, limit the definition of Access BPL to devices located on the utility side of the electric service demarcation point with the utility customer, and/or exclude from Access BPL any devices located on electric power lines located within customer premises.[45] Southern agrees with Duke and NTIA that it would also be appropriate for the Commission to adopt a complementary definition of In-House BPL to further clarify the distinctions between these systems.[46]

C. The Definition Should Confirm Need for Utility Control

In its Comments, Southern pointed out the safety and reliability concerns associated with attaching Access BPL devices to utility assets used to provide regulated utility service.[47] Because of overriding concerns with the integrity of the electric grid, Southern urged the Commission to make clear that all Access BPL equipment must be

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[45] Southern at 13-14, Duke at 5, UPLC at 4, Progress Energy at 2, and PPL Telecom at 3-4.

[46] Duke at 5, NTIA at 3.

[47] Southern at 14.

installed, owned and/or operated by the electric utility or an affiliate thereof. Southern posited that at a minimum, it is critical that the installation of all BPL equipment, particularly equipment that will be coupled onto energized power lines and any attachments made in the electric supply space, must be performed only by utility crews or approved utility contractors.

Other parties noted that the provider of BPL service might not be the utility, *per se*.[48] Southern agrees that there are several possible business models under which BPL service could be provided to the public. Nevertheless, the Commission should make clear that because of the safety and reliability issues associated with Access BPL, the utility or an affiliate thereof must install, own and/or operate the BPL system.

IV. THE PROPOSED EMISSION LIMITS ARE ADEQUATE FOR INITIAL BPL DEPLOYMENTS

In the *NPRM*, the Commission noted the wide difference of opinion among parties filing comments on the *NOI* as to the interference potential of Access BPL.[49] While the opponents of BPL have expressed concern with the potential for BPL to interfere with various types of radio services, utilities and BPL equipment manufacturers presented evidence that there had been no reported cases of harmful interference.[50] Moreover, NTIA has also recommended that the FCC continue to make Access BPL systems subject to the existing Part 15 radiated emission limits for carrier current systems.[51]

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[48] Ameren at 3, and Main.net at 5.

[49] *NPRM* at para. 14.

[50] Southern at 15.

[51] NTIA at 7.

Now, more than a year after issuance of the original *NOI* on BPL, the record is still lacking substantial evidence of any interference problems with BPL that would warrant a reduction in the existing Part 15 limits. To the contrary, and as summarized below, record evidence indicates that operators of BPL networks have received very few complaints of interference and that they have successfully mitigated whatever harmful interference was confirmed.

A. No Significant Evidence that Existing Emission Limits are Inappropriate

Opponents of BPL seize on the notion that electric power lines will serve as large antennas, thereby creating the potential for harmful interference at great distances from the BPL devices and the power lines to which they are attached. To the contrary, comments of parties manufacturing or operating BPL networks indicate that claims that the power system will operate like a large antenna are specious. Hawaiian Electric noted that given the typical BPL implementation, "it is highly improbable that the electrical distribution network would become one continuous, aggregated antenna that will cause widespread radio interference."[52] Current Technologies also confirmed that Access BPL devices do not use power lines as antennas, but only as means of conducting data signals. Current Technologies explained that emissions from its BPL devices "radiate almost entirely from a short segment of line immediately adjacent to where the BPL device is attached," and that from a few meters away "the signal closely resembles that from a point source, much like other common sources of radiofrequency noise such as

[52] HECO at 3.

computers and household appliances."[53] Similarly, PowerWAN stated that it has found that "power lines are very inefficient as antennas, and that they tend to act much like point source radiators."

Commenters have also noted that no cumulative effects from BPL devices have been observed, nor are any anticipated.[54] Current Technologies explained that with its system, only two devices, each operating on different frequencies, can operate on a given line segment or cell, each of which covers several hundred meters. Since emissions drop off rapidly with distance, emissions cannot accumulate in a given receiver. According to Current Technologies the "cumulative" emissions from BPL devices "are no greater than those from commonplace unintentional emitters."[55]

Evidence from trial deployments further supports these assessments. Hawaiian Electric reported that in two years of BPL testing, it "has not received one substantiated interference complaint within the direct vicinity of [its] BPL equipment."[56] PPL Telecom reported that since initiating BPL operations in February 2002, it has experienced only three informal complaints of interference, and that all of these complaints were addressed in a timely manner through remote reconfiguration of its BPL operating frequencies.

Perhaps the most telling evidence of the non-interference nature of BPL is the fact that there have been no verifiable interference complaints in connection with the over one million HomePlug devices that have been deployed so far.[57] While these devices operate

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[53] Current Technologies at 14.

[54] PPL Telecom at 5, and Current Technologies at 17.

[55] Current Technologies at 17.

[56] HECO at 13.

[57] HomePlug Powerline Alliance at 1.

within the home, one would anticipate higher probabilities of interference from such devices since they are located very close to other consumer devices and are not professionally installed.

To the extent any interference from BPL has been "discovered," there is some evidence in the record that the opponents of BPL took deliberate steps to identify discrete spots where communications service might be disrupted if someone were to actually attempt to initiate communications from those locations (*e.g.*, by using a mobile transceiver). Progress Energy reported that it has received complaints of interference from amateur radio licensees who intentionally seek out interference using very sophisticated and sensitive equipment.[58] Southern agrees with Progress Energy that the Commission should take this opportunity to clarify that "harmful interference," as defined at Section 15.3(m) of the Commission's Rules, is a *functional* definition that takes into consideration the severity of the interference in relation to a properly operating communication service. The existing definition of "harmful interference" at Section 15.3(m) is as follows:

> "(m) *Harmful Interference*. Any emission, radiation or induction that endangers the functioning of a radio navigation service or of other safety services or seriously degrades, obstructs or repeatedly interrupts a radiocommunications service operating in accordance with this chapter."[59]

Southern agrees with Progress Energy that the Commission should confirm the application of this definition to allegations of BPL interference. Borrowing from Progress Energy's recommendations, Southern recommends that the Commission require that: (1) the interference should occur in the normal course of the complainant's

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[58] Progress Energy at 8-9.

[59] 47 C.F.R. §15.3(m).

operations rather than the result of the complainant seeking out the interference; (2) the interference should be more than momentary or not capable of being eliminated by, for example, a mobile receiver relocating a short distance away; and (3) the interference should so greatly interfere with operations that communications is seriously degraded.[60]

B. Opponents of BPL Have Not Substantiated the Need for Drastic Emission Reductions

A number of parties have expressed concern that Access BPL will cause harmful interference to licensed radio services, but in essence, each party opposing the deployment of BPL can only speculate as to whether BPL will cause harmful interference. These parties describe their anxiety about BPL deployment without firm evidence that BPL will necessarily cause harmful interference to these operations. Moreover, the opponents of BPL do not explain why BPL, operating in compliance with the emissions limits of Part 15 applicable to unintentional radiators, are more likely to cause harmful interference than any other unintentional radiator. Commenters variously allege that BPL:

- Might interfere with TV broadcasts[61]
- Might affect telephone communications[62]
- Might interfere with DSL services[63]
- Might interfere with amateur radio[64]

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[60] Progress Energy at 8-9.

[61] Association for Maximum Service Television (MSTV) at 2.

[62] BellSouth at 5-6 and Verizon at 2.

[63] Verizon at 2.

[64] ARRL at 2-3.

- Might interfere with oil spill channels[65]
- Might interfere with signals from Jupiter and the Sun[66]
- Might interfere with maritime communications[67]
- Might affect aviation communications[68]
- Might interfere with fleet tracking systems[69]
- Might affect radio call boxes[70]
- Might interfere with alarm systems[71]
- Might interfere with shortwave radio broadcasts[72]
- Might interfere with remote-control model airplanes.[73]

The opponents of BPL have suggested a number of measures, ranging from the draconian to the impractical, to protect their services from the perceived threat of BPL. Yet fundamentally, none have explained why BPL should be treated so drastically different from all other unintentional radiators operating under Part 15.

The opponents of BPL overlook the fact that the restrictions in Part 15 are intended to sufficiently reduce the *probability* of harmful interference, not to eliminate the possibility entirely. If Part 15 were construed in the manner suggested by the

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[65] American Petroleum Institute (API) at 2-3.

[66] Society of Amateur Radio Astronomers (SARA) at 1-2.

[67] ShipCom at1.

[68] Aeronautical Radio, Inc. (ARINC) at 3.

[69] Global2Way at 2.

[70] International Municipal Signal Association (IMSA) at 3.

[71] Central Station Alarm Association (CSAA) at 4.

[72] North American Shortwave Association (NASWA) at 2.

[73] Academy of Model Aeronautics.

opponents of BPL, virtually no unlicensed devices would exist in the marketplace because the manufacturers and users of such devices would not be able to state, with absolute certainty, that their devices will not cause harmful interference to other services under any circumstances.

Even after measuring emissions from operational BPL systems and modeling their characteristics, NTIA remains very supportive of BPL. In his April 27, 2004, letter to the FCC transmitting the results of NTIA's Phase 1 interference studies, the Acting Administrator of NTIA noted that the "[t]imely and successful completion of the Commission's BPL docket will lay the foundation for meeting the President's vision for the availability of competitive, universal, and affordable broadband services by 2007." The Acting Administrator also called on both the FCC and NTIA to "find solutions that both protect critical systems and…allow the realization of the promise of a third broadband wire into the home." Unlike the opponents of BPL, NTIA apparently believes that BPL can be implemented consistent with Part 15.

Southern does, however, question a number of the specific findings in NTIA's report. First, NTIA has not described its measurement procedures with the level of specificity that one would need in order to be able to replicate its findings. This is particularly troublesome since NTIA has offered recommendations on how and where emissions from BPL systems should be measured yet it is unclear where and how NTIA conducted its own measurements. Second, many of NTIA's conclusions appear to have been based on its computer modeling, which NTIA concedes had to be simplified due to the number of variables involved in modeling an electric power system and the limits on

computer random access memory.[74] Third, some of NTIA's observations appear at odds with general radio theory. For example, NTIA predicts that a single BPL device could cause a 3 dB reduction in the signal-to-noise ratio at 50% of the fixed receiver locations within 310 meters of a power line, when one would expect that BPL emissions would be reduced by 50 dB just through free space loss over that distance. Finally, NTIA has requested "special protections" for 41 Federal government bands, even though Section 15.205 already provides special protection from *intentional* radiators for certain bands. Part 15 provides no comparable protection from *unintentional* radiators, and it is unclear why BPL is being singled-out to provide such protection when other unintentional radiators, operating at the same emission limits, have not been required to protect these or other Federal government bands.

In its Comments, NTIA further suggests that the FCC define, by rule, certain restrictions on BPL operations in certain bands or geographic areas.[75] NTIA describes these restrictions as: (1) "coordination areas," where BPL deployments on any frequency must be pre-coordination by the BPL operator with a licensed user; (2) "exclusion zones," in which BPL emissions would be prohibited on certain specific frequencies; and (3) "excluded bands," in which BPL may not be operated in any geographic area. Aside from a few general examples, NTIA has not provided information on the number or size of geographic areas in which coordination or exclusion would be required. Similarly, NTIA has not provided detail on the amount of bandwidth that it believes should be excluded from BPL devices on a nationwide basis. A good portion of Southern's electric service territory is along the Gulf of Mexico and other navigable waterways. Depending

[74] NTIA Phase 1 Report at 5-7 and 5-8.

[75] NTIA at 7.

on the geographic scope of the suggested "exclusion zones" around Coast Guard coast stations, such a requirement could severely restrict or even preclude Southern from providing cost-effective broadband service in these areas. Without further information and clarification on these concepts, Southern urges the Commission to reject any requirement for such "exclusion zones" or "exclusion bands."[76]

C. BPL Emission Limits Should Be Increased After More Experience is Gained

Southern renews its request that the Commission remain open to increasing the radiated emissions limits as more measurement data is developed, BPL and receiver technology improves, and systems are extended into areas with longer line distances.[77] Other parties made similar recommendations.[78] Southern also concurs with Main.net that until the rules can be revised to generally raise the emission limits for Access BPL, the Commission should allow exceptions on a case-by-case basis.[79]

D. No Conducted Emission Limits Are Necessary for Access BPL

The Commission proposed to exempt Access BPL systems from the conducted emission limits of Section 15.107(c) due to the safety hazards of measuring conducted emissions on medium voltage power lines and the fact that such measurements will not significantly aid in reducing interference. Southern and other commenting parties

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[76] Southern understands the potential need to coordinate with certain select government radio installations already identified in the FCC's Rules, such as the National Radio Quiet Zone in Green Bank, West Virginia.

[77] Southern at 17.

[78] Duke at 13, UPLC at 7, and Progress Energy at 5.

[79] Main.net at 5.

supported this proposal.[80] Southern found no comments supporting imposition of conducted emission limits on Access BPL. Therefore, the Commission should adopt its proposal to exempt Access BPL systems from conducted emission limits.

V. SOUTHERN SUPPORTS FLEXIBILITY IN MITIGATION TECHNIQUES

The Commission has proposed requiring Access BPL systems to incorporate "adaptive interference mitigation techniques," such as dynamic or remote power reduction or adjustment in operating frequencies. The Commission has also proposed requiring Access BPL systems to incorporate a shut-down feature to deactivate units found to cause harmful interference.[81]

A. If Mitigation Techniques are Needed, Rules Should Allow Flexibility

Southern and other parties noted that such mitigation requirements are probably unnecessary.[82] AT&T recommended that the Commission not mandate development of additional interference mitigation capabilities "unless marketplace experience shows they are required."[83] Southern agrees with AT&T that "[m]andating the design, development, and implementation of any such non-warranted requirement would unduly delay prompt deployment of BPL."[84] Similarly, Southern agrees with NTIA that BPL operators will have a strong marketplace incentive to prevent and eliminate harmful interference.[85]

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[80] Southern at 17, and UPLC at 8-9.

[81] *NPRM* at paras. 40-42.

[82] Southern at 18, AT&T at 5-6.

[83] AT&T at 2.

[84] AT&T at 5.

[85] NTIA at 8.

To the extent the extent the Commission imposes such a requirement, however, Southern urges the Commission to allow flexibility on what techniques will be used and how those techniques should be applied. Southern noted that BPL equipment manufacturers are already incorporating mitigation techniques into their products, and they will have continuing incentive to develop products that will operate in conformity with Part 15's non-interference requirement.[86] New BPL technologies or network architectures may further reduce the potential for interference, and a mandate to include arbitrary mitigation techniques might add unnecessary costs to BPL equipment. Southern therefore renews its request that any requirement for mitigation techniques be flexible to accommodate any techniques reasonably intended by BPL equipment manufacturers to allow for prompt and effective mitigation of harmful interference.

B. Shut-Down Should Not Be Mandated as a First Response

A number of parties have requested the Commission to clarify its intent with respect to a "shut-down" feature in BPL equipment. These parties have asked the Commission to clarify that incorporation of a remote shut-down capability does not imply that a BPL unit must be deactivated as the first response to an interference complaint.[87] NTIA has noted that the shut-down requirement of Section 15.5(c) of the FCC's Rules is misleading in the unique case of BPL. Southern agrees with NTIA that "[s]hut-down is a last resort after first attempting the many other interference mitigation techniques available to Access BPL systems."[88] Southern operates a large number of licensed radio

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[86] Southern at 19.

[87] Con Edison at 4, UPLC at 10, and Progress Energy at 6.

[88] NTIA at viii.

systems in support of its electric operations and has significant experience in identifying and resolving interference. Because of the critical nature of these facilities to Southern's operations, Southern first attempts to remediate interference through any technical solutions available to it before taking the drastic step of shutting down a transmitter entirely. Southern also agrees with Con Edison that proposed Section 15.109(f) should be revised to indicate that cessation of operations is a last resort if remediation of interference by adjustment of operations is unsuccessful.[89] Southern also concurs with Progress Energy that a shut-down capability should be manually controlled because automated shut-down could potentially disable a normally operating system.[90] Southern would further note that other unintentional radiators are not subject to an automatic or remote shut-down capability.

C. Suggestions Raised by Opponents of BPL Are Unnecessary and Would Be Detrimental to BPL Deployment

Some of the opponents of BPL have recommended extreme measures that would needlessly hinder the deployment of BPL. For example, the Potomac Valley Radio Club (PVRC) recommends that resolution of interference complaints should be based on *bands*, not on frequencies.[91] Under PVCR's recommendation, even if the BPL operator can protect certain frequencies on a discrete basis, the BPL operator would be required to provide the same level of protection to other frequencies in the same "band" even if there are no complaints of interference related to these other frequencies. This could easily

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[89] Con Edison at 4, 7.

[90] Progress Energy at 6.

[91] PVRC at 6

prevent whole bands of frequencies from being used for BPL despite a lack of interference to other licensed systems in the area.

A few commenters have asked the Commission to dictate the precise timeframes within which BPL operators would be required to respond to interference complaints. At one extreme, API suggests that BPL operators should be required to immediately shut-down merely upon notification of potential interference.[92] Other commenters suggest 4-hours to shut down or 24 hours to respond to interference complaints.[93] Southern believes it is far too premature for the Commission to micromanage when and how BPL operators respond to interference reports. The evidence so far indicates that interference is unlikely to occur, and where it has occurred, the parties have been able to resolve it in a timely manner. The Commission possesses adequate enforcement authority to deal with BPL operators who consistently fail to respond in a reasonable fashion to legitimate interference complaints. The Commission does not prescribe specific response times for resolving other operational or interference issues in other services, nor should it do so here.

One commenter has suggested that BPL operators should be required to employ multilingual employees so that BPL operators could address interference complaints from non-English-speaking shortwave radio listeners.[94] Not only is this suggestion unworkable, it would place BPL operators at an unreasonable disadvantage vis-à-vis any other communications service provider.

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[92] API at 11.

[93] PVRC at 6 and ShipCom at 4.

[94] NASWA at 5.

Finally, Southern urges the Commission to reject ARINC's request that BPL systems be required to employ all of the interference mitigation techniques suggested by the Commission.[95] As noted above, it is unwise for the Commission to limit flexibility in BPL system design in the manner suggested by ARINC. Incorporating all possible mitigation features, whether or not needed, will only serve to drive up costs without sufficient evidence of a commensurate public interest benefit.

D. NTIA's Mitigation Suggestions Are Generally Reasonable Provided They Are Not Mandated

NTIA has proposed a number of techniques that it believes would help reduce the potential for interference from BPL systems and which could be used to mitigate any harmful interference that might occur.[96] In general, Southern believes many of these suggestions are reasonable steps that could be taken by a BPL operator so long as these techniques are not mandated by rule. These techniques could be considered by BPL operators for inclusion in their interference mitigation "toolbox," but because of the variety of technologies and network architectures, it would not be prudent or practical for the Commission to adopt these suggestions as mandatory conditions of BPL system operation.

NTIA notes, for example, that the "single most effective method for reducing the potential for harmful interference from a BPL device may be to reduce the power it

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[95] ARINC at 4. Southern notes that ARINC is also a competitive provider of broadband services to the public using unlicensed wireless devices, under the service name "Opti-Fi Wireless." (http://www.arinc.com/products/voice_data_comm/wlan_for_airports.html).

[96] NTIA Phase 1 Report at Section 8.

generates."[97] This is a fundamental principle of spectrum management which could be applied to any service relying on radiofrequency energy. However, the amount of power needed is also a function of distance and throughput. Southern does not agree with NTIA's suggestion that a reduction in power could be accompanied by an increase in the number of devices in order to maintain data throughput. Installation of a greater number of devices may or may not reduce the overall interference potential, but it will *definitely* increase deployment costs. Power reduction at specific devices and/or specific frequencies at specific devices should be considered as one option for mitigating interference.

Southern also agrees with NTIA that techniques such as frequency avoidance, using balanced differential BPL signal injection, and using blocking filters to limit the reach of BPL signals beyond where they are needed could also be useful components in the mitigation toolbox. Again, however, the viability of these techniques will depend on the type of technology and network and should not be made mandatory.

NTIA suggests that it would be prudent to have one entity in a given area controlling all of the devices in the area, as well as one contact point for that entity, so that suspected cases of interference can be addressed without government intervention.[98] Southern agrees with this concept, and, as noted above, has recommended that the definition of Access BPL recognize that the utility, or an affiliate of the utility, must be involved in the installation, ownership and/or operation of the BPL system. Not only are there serious safety issues involved, but such restrictions would also, as NTIA notes, greatly facilitate interference resolution and improve accountability.

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[97] NTIA Phase 1 Report at 8-1.

[98] NTIA Phase 1 Report at 8-4.

NTIA has indicated that it is exploring whether it could make portions of its frequency assignment database available to BPL operators to assist in frequency selection. Southern supports this effort and believes that having access to this data could be helpful in system deployment and interference resolution. Southern would, however, oppose any attempt to mandate prior "frequency coordination" since this would effectively subject BPL to the same conditions as a licensed service without the benefits of licensing. By virtue of the non-interference conditions of Part 15, BPL operators will have sufficient incentive to take whatever measures they deem reasonable and prudent to minimize the potential for interference, both to other systems and into their own systems.

E. BPL Equipment Should Be Grandfathered

A number of commenting parties urged the Commission to grandfather BPL equipment that was installed prior to the effective date of any new rules on BPL equipment standards.[99] In its Comments, Southern noted that the Commission gave clear signals that BPL systems could be deployed under the existing Part 15 rules, and that BPL operators have every incentive to incorporate equipment that will be as interference-resistant as possible. Current Technologies concurred, noting that "BPL technology is advancing so rapidly that early equipment is likely to be replaced on a rapid schedule."[100] Similarly, Progress Energy posits that once a system has been installed and is operating within the requirements when it was installed, it should be allowed to remain in operation as long as it remains in compliance with those requirements.[101] Southern agrees with

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[99] Southern at 19, Duke at 11-12, UPLC at 9, Progress Energy at 7, Current Technologies at 19, and Echelon at 3.

[100] Current Technologies at 19.

[101] Progress Energy at 7.

these comments and urges the Commission to grandfather BPL equipment that might not conform to any new technical standards adopted in this proceeding.

F. BPL Equipment Verification or Certification Should Continue to be the Responsibility of the Manufacturer, not the BPL Operator

NTIA has recommended that BPL equipment be subject to equipment certification instead of verification.[102] NTIA suggests that certification is appropriate so that the Commission will have an opportunity to review the measurement reports and thereby help in identifying any systematic interference problems that might arise from BPL systems; yet, NTIA concedes that it does not expect any systematic interference problems.[103] Southern therefore questions whether there is sufficient justification for a certification requirement.

Of greater concern to Southern, however, is NTIA's suggestion that the certification requirement should be imposed on the BPL operator, not the manufacturer, because the BPL operator "will receive the BPL service revenue benefit" and will have a strong incentive to limit interference risks."[104] Southern strongly opposes this recommendation as placing yet another unnecessary burden on the BPL operator. A requirement for each BPL operator to take technical measurements and submit them to the FCC for approval prior to operating would effectively subject BPL operators to FCC licensing without any corresponding benefit.

In addition, by removing the equipment approval requirement from the BPL equipment manufacturer, the Commission will lose an important means of regulating and

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[102] NTIA at 14-15.

[103] NTIA at 15.

[104] NTIA at 14.

enforcing its emission limits. Under NTIA's proposal, each BPL operator would be required to independently set up test parameters conforming to the FCC's rules or guidelines and submit that test data to the FCC for approval. With no prior verification or certification requirement placed on the manufacturer of the equipment, each BPL operators is left with the unique responsibility, alone among the universe of radiofrequency operators, of confirming that the equipment meets FCC requirements. In turn, the FCC will be left unable to act against the equipment manufacturer should violations of emissions limits occur. Its only recourse will be against the BPL operator. By leaving the equipment authorization requirement on the manufacturer, as is the case with every other radio device, the Commission will actually have two levels of enforcement available to it; that is, the manufacturer will be responsible for confirming basic compliance with the emissions limits, and the BPL operator will be responsible for operating that equipment in a manner that will not cause harmful interference. Southern therefore urges the Commission to reject NTIA's novel recommendation that would effectively transform BPL into a licensed service that has none of the benefits of licensing.

VI. THE PROPOSED MEASUREMENT GUIDELINES SHOULD BE STREAMLINED

The Commission has proposed guidelines for measuring the emissions from BPL systems in order to assess compliance with the Part 15 emission limits.

A. Measurements Should Be Allowed Near Ground Level

Southern supports the Commission's proposal to allow measurements to be taken near the ground. Southern shares the Commission's concern that testing at or above the

height of the electric line raises a number of safety issues and would significantly increase the costs of verifying compliance.

B. NTIA's Recommendations on Measurements are More Complicated Than Necessary

Southern disagrees with a number of NTIA's recommendations for measuring BPL emissions. For example, NTIA recommends placing the BPL device under test near the center of a straight section of power line at least 600 meters in length and devoid of significant impedance discontinuities.[105] Southern believes this would be an impractical requirement for measurements and would not present an accurate picture of how BPL devices will actually be deployed in the field. Southern recommends that the Commission adopt its proposal for BPL systems to be measured at no less than three representative installations and that it add the further clarification that the BPL operator is primarily responsible for determining whether the installations tested are "representative" of the types of configurations the BPL operator is likely to deploy in practice.[106]

As noted above and due to safety considerations, Southern disagrees with NTIA's initial recommendation that BPL measurements be taken at 10 meters above ground. Southern would not necessarily oppose taking measurements at such height if it were also clear that the measurement were to be made from at least 10 meters horizontal distance from the line. However, Southern believes it will be far preferable if BPL operators can take measurements near ground level. In its more recent Comments in this docket, NTIA expressed agreement with the FCC's proposal to measure at one meter height but also recommended applying a 5 dB correction factor to estimate the actual peak field

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105 NTIA Phase 1 Report at 7-6.

106 Southern at 21.

strength.[107] NTIA's selection of a 5 dB correction factor appears to be based primarily on computer modeling.[108] Southern does not have enough information at this point to address whether it would be appropriate to apply any correction factor to measurements taken at 1 meter height, much less to express an opinion on whether 5 dB would be the appropriate correction factor.

NTIA has recommended that there be a "comprehensive search" for the overall peak field strength along key segments of the power lines at the one meter height and at the specified horizontal measurement distance.[109] NTIA also stated, however, that it is further studying field strength trends along power lines and intends to provide additional guidelines to facilitate identification of peak field strength. Southern's testing so far indicates that the peak is located very close to the signal injection point. Since NTIA concedes that it might not be necessary to take measurements all along the power line to find the peak field strength, Southern recommends that measurements only be required within a relatively short distance from the signal injection point, or that any such guidelines be permissive in only requiring measurements in areas where prior testing has indicated a high probability of finding the peak field strength.

Finally, Southern disagrees with NTIA's recommendation that measurements be taken sequentially across the entire frequency range over which the BPL device could operate. Such a requirement could greatly increase the costs of verifying BPL system compliance without significantly improving the confidence that the device under test complies with the Part 15 limits. Southern believes that measuring emissions from three

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107 NTIA at 20-21.

108 NTIA at Technical Appendix, Section 2.4.

109 NTIA at 19.

or four frequencies across the range that could be used by the device should be sufficient to verify compliance. It should be noted that compliance testing for purposes of initial equipment authorization or testing at initial BPL system deployment present far different situations than the testing that might be conducted following system deployment. Once a network is up and operating, conducting sequential testing across a large number of frequencies would be extremely difficult due to the need to coordinate frequency usage among all the devices on the same line as the device under test. In fact, it might be necessary to take the network down in order to conduct such testing. Southern therefore urges the Commission to limit the number of frequencies that would have to be measured in order to verify compliance.

C. Complex Measurement Requirements Proposed by Opponents of BPL Should Not be Adopted

Opponents of BPL have raised a number of recommendations associated with compliance testing that would retard BPL system deployment without any corresponding improvement in the RF environment. API, for example, urges the Commission to require *in situ* measurements of every installed BPL device.[110] Again, it is unclear why BPL is being singled out for such treatment when other Part 15 devices and services – some of which are undoubtedly used by API member companies – are not subject to a device-by-device *in situ* testing requirement.

API has also recommended that measurements be taken continuously along both sides of the power line as well as underneath it.[111] API's recommendations would grossly increase the cost and complexity of BPL compliance measurements. Southern believes

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[110] API at 9-10.

[111] API at 10.

that as BPL systems are deployed and more measurements are taken, it may be possible to draw conclusions as to which side of a power line (depending on the configuration of the line and number of conductors) should be tested. Southern therefore strongly opposes API's recommendations for multiple measurements around the line.

Sprint has recommended that measurements also be taken at street lamp poles on BPL systems used in connection with underground power lines.[112] Southern believes Sprint's recommendation is based on certain experiences with BPL in Europe. However, power systems and BPL couplings are very different in the United States, and it is not at all clear that street lamp poles will exhibit any effects from underground BPL systems.

VII. OTHER ISSUES ARE BEYOND THE SCOPE OF THIS RULEMAKING

Few parties have raised issues that are beyond the scope of the present rulemaking. For example, the U.S. Department of Justice has argued that Access BPL systems will be subject to the Communications Assistance for Law Enforcement Act (CALEA) because BPL providers will be providing communications service "a common carrier for hire."[113] While it is doubtful that Access BPL systems will be operated as "common carrier" communications systems, it is sufficient to note that the regulatory status of BPL is beyond the scope of this proceeding.

The National Energy Marketers Association (NEMA) posits the unique position that the FCC should enter an agreement with the Federal Energy Regulatory Commission (FERC) under which the agencies would clarify that the FCC has jurisdiction over the

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[112] Sprint at 3.

[113] U.S. Department of Justice at 4-5.

Part 15 aspects of Access BPL while FERC has jurisdiction over electric power lines.[114] NEMA suggests that this is necessary because the FCC has no statutory authority to mandate open access to electric power lines. NEMA's request is outside the scope of this proceeding. It is not apparent that FERC has any jurisdiction over electric *distribution* plant or how electric utilities use their distribution plant for communications purposes.

VIII. CONCLUSION

The record in this proceeding confirms the Commission's tentative conclusion that Access BPL could provide many public interest benefits, including greater facilities-based broadband competition and improvements in the operating efficiency of the nation's electric power delivery systems. The comments in this proceeding also indicate that although many licensed users have generalized fears of BPL, very few complaints of harmful interference from the BPL systems deployed to-date under the existing Part 15 emission limits have been made. Finally, the comments demonstrate that the operators of BPL systems will have strong marketplace incentives to install and operate their systems in order to avoid causing harmful interference, and that it is therefore unnecessary and inappropriate to saddle these systems with requirements that would mandate specific interference mitigation techniques be incorporated into each device. Such requirements would only increase the costs of such devices and limit manufacturers' and operators' flexibility in designing new network architectures.

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[114] NEMA at 3.

WHEREFORE, THE PREMISES CONSIDERED, Southern respectfully requests the FCC to take action in this docket consistent with the views expressed herein.

Respectfully submitted,

SOUTHERN LINC, SOUTHERN TELECOM, INC., AND SOUTHERN COMPANY SERVICES, INC.

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