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

AUG 0 9 2006
FCC Mail Room

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

MEMORANDUM OPINION AND ORDER

Adopted: August 3, 2006 **Released: August 7, 2006**

By the Commission: Chairman Martin; and Commissioners Copps, Tate and McDowell issuing separate statements.

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I. INTRODUCTION

1. In response to various petitions for reconsideration of the *Report and Order* in this proceeding, we are further amending Part 15 of our rules regarding the unlicensed operation of Access broadband over power line (BPL) systems.[1] Specifically, we are amending the rules to eliminate the exclusion zone requirement for the ten listed radio astronomy facilities and to add a new exclusion zone for one Very Large Array (VLA) radio astronomy observatory site at 73.0-74.6 MHz. In addition, we are amending the rules to add prospective protection for relocated aeronautical facilities and to correct the coordinates and email contact for the aeronautical facilities subject to BPL consultation. We believe these changes will further the development and growth of BPL devices. We are denying the petitions for reconsideration in all other respects.

II. BACKGROUND

2. The Commission's Part 15 rules for radio frequency (RF) devices have long provided for operation of carrier current systems, which are devices that couple RF energy onto the electric power lines for communication purposes.[2] For example, amplitude modulated (AM) radio systems on some school campuses employ carrier current technology;[3] many devices intended for the home, such as intercom systems and remote controls for electrical appliances and lamps utilize carrier current technology;[4] and for many years electric utilities have been using carrier current technology to monitor and control the electrical power grid. Generally, these systems have provided communications at relatively slow transmission speeds on carrier frequencies below 2 MHz. More recently, the availability of faster digital processing capabilities and the development of sophisticated modulation schemes have allowed the development of a new type of carrier current systems that use spread spectrum or multiple carrier techniques capable of delivering high-speed communications. These systems carry broadband digital signals and have come to be called BPL systems.

3. The new BPL systems couple RF energy onto either the low-voltage power lines inside a building ("In-House BPL") or onto the medium-voltage power delivery lines ("Access BPL").[5] In-House BPL systems use the electrical outlets available within a building to transfer information between computers and between other home electronic devices, eliminating the need to install new wires between

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[1] *See Report and Order* in ET Docket No. 04-37, 19 FCC Rcd 21265 (2004).

[2] A carrier current system is defined as a system, or part of a system, that transmits radio frequency energy by conduction over an electric power line to a receiver also connected to the same power line. *See* 47 C.F.R. §§ 15.3(f) and (t), 15.5, 15.31(d), (f), (g) and (h), 15.33(b)(2), 15.107(a)-(c), 15.109(a), (b), (e) and (g), 15.113, 15.201(a), 15.207(c), 15.209(a) and 15.221.

[3] Campus radio systems have been operating for over fifty years in the United States at many universities as unlicensed broadcast radio stations in the AM Broadcast band. Initially, the receiver and signal source were attached to the same electric power line. With the advent of the transistor radio, receivers are able to pick up enough signal for adequate reception when placed next to the electric power line in a dormitory or other locations on the electric power lines. *See* 47 C.F.R. § 15.221.

[4] *See e.g.*, X-10 products for home automation at <http://www.X10.com>, and products conforming to ANSI/EIA-600.31-97 *Power Line Physical Layer and Medium Specification* (CEBus Standard).

[5] In-House BPL uses the 110 volt power wiring inside a residence or business to carry information within a structure. Access BPL typically uses the medium voltage exterior power distribution network lines (carrying between 1,000 to 40,000 volts) as a transmission medium to bring high-speed communications services, *e.g.*, the Internet and other broadband services, to neighborhoods from where they are delivered to users.

devices, and hence facilitating the implementation of home networks.[6] Access BPL systems deliver high speed Internet and other broadband services over the utilities' medium voltage delivery power lines to homes and businesses. In addition, electric utility companies can use Access BPL devices to monitor and manage various elements of their electric power distribution operations.

4. Because Access BPL equipment injects RF onto unshielded, unpaired medium voltage lines, there is potential for these systems to leak radio frequency energy that can cause interference to radio users. In its October 14, 2004 *Report and Order* in this proceeding, the Commission recognized the significant benefits that BPL technology offers to the American public in extending broadband access to homes and businesses and introducing additional competition to existing broadband services, such as cable modem and Digital Subscriber Line (DSL) services. However, it also recognized that those substantial benefits might not be realized if BPL devices were to cause interference to licensed services and other important radio operations. Accordingly, the Commission established technical standards, operating restrictions and measurement procedures for Access BPL to minimize instances of interference and to facilitate resolution of such interference where it might occur.

5. The rules adopted in 2004 require Access BPL systems to continue to comply with the Part 15 radiated emission limits for carrier current systems operating as unintentional radiators.[7] In addition, the rules require that Access BPL systems incorporate capabilities to remotely modify their operations to avoid using any specific frequency (*e.g.*, to "notch" a frequency band), and to shut down any unit that is causing harmful interference.[8] The rules also require these systems to avoid operating in certain "excluded" frequency bands used by aeronautical land stations and aircraft receivers and to avoid operating in specific frequencies in certain "exclusion zones", which are geographic locations in close proximity to sensitive and critical operations such as U.S. Coast Guard and maritime public coast stations and radio astronomy receive stations.[9] The rules further establish a number of "consultation areas" whereby operators of Access BPL systems located in those areas are required to notify and consult with a Federal government, public safety, or aeronautical facility's point of contact regarding the need to protect critical radio operations prior to commencement of service.[10] The rules require the BPL industry to establish a publicly available Access BPL database containing certain information needed for interference identification and resolution.[11] In addition, the rules provide improved measurement procedures for all equipment using radio frequency to communicate over power lines.[12] Finally, the Commission changed the equipment authorization for Access BPL systems from verification to certification to allow it to maintain oversight of these systems until additional experience is obtained from their wide deployment.[13]

6. Subsequent to release of the *Report and Order*, fifteen parties filed for reconsideration

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[6] Home networks allow information to be transferred among computers, set-top boxes, information appliances and consumer electronics devices. Applications of home networking include, for example, shared Internet access, shared printing, file sharing between personal computers, and device control.

[7] 47 C.F.R. § 15.611(b). Although carrier current systems are typically unintentional radiators, they are required to comply with the radiated emission limits of Section 15.209 below 30 MHz, which apply generally to intentional radiators.

[8] 47 C.F.R. § 15.611(c).

[9] 47 C.F.R. § 15.615(e) and (f).

[10] 47 C.F.R. § 15.615 (f)(3).

[11] 47 C.F.R. § 15.615(a).

[12] *See Measurement Guidelines (Guidelines) for Broadband over Power line (BPL) Devices or Carrier Current Systems (CCS) and Certification Requirements for Access BPL Devices* in Appendix C of *Report and Order*.

[13] 47 C.F.R. § 15.101(a).

regarding various aspects of these Part 15 BPL regulations. A list of the petitioners and the parties that filed oppositions and replies to the petitions is attached as Appendix A.

III. DISCUSSION

7. The petitions for reconsideration request changes to a variety of rules adopted for Access BPL in this proceeding. Amperion, Inc. (Amperion), Current Technologies LLC (Current) and the United Power Line Council (UPLC) seek changes to the deadlines for Access BPL database notification and for deployment of grandfathered equipment. Aeronautical Radio, Inc. (ARINC), the American Petroleum Institute (API), the Association for Maximum Services Television, Inc. (MSTV), and Cohen, Dippell and Everist, P.C. (CDE) seek additional restrictions of BPL emissions in the frequency bands used by specific licensed radio services. The American Radio Relay League (ARRL), G. Scott Davis (Davis), Steven E. Matda (Matda), W. Lee McVey (McVey), Cortland E. Richmond, Edwin Whedbee, and the National Antenna Consortium and the Amherst Alliance (NAC/Amherst) generally request the Commission to rescind the adopted rules for Access BPL pending further study of BPL interference characteristics. At the same time, these parties also seek additional technical and operational restrictions on BPL. The National Telecommunications Information Administration (NTIA) also asks for changes to the facilities for which it requests particular protection. We discuss the requests in these petitions below.

A. Notification to the Access BPL database

8. In the *Report and Order* in this proceeding, the Commission adopted a requirement that the Access BPL industry establish a publicly accessible database for system information.[14] Under this requirement, entities operating Access BPL systems must provide the BPL industry designated database manager with the following information 30 days prior to the initiation of any operation or service: 1) the name of the Access BPL provider; 2) the frequencies of the Access BPL operation; 3) the postal zip codes served by the specific Access BPL operation; 4) the manufacturer and type of Access BPL equipment being deployed (i.e., FCC ID); 5) point of contact information (both telephone and e-mail address) for interference inquiries and resolution; and 6) the proposed/or actual date of Access BPL operation.[15] The database manager is required to enter this information into the publicly accessible database within 3 business days of receipt.[16] The intent of the notification and database requirements is to ensure that licensed users of the spectrum have a publicly accessible and centralized source of information to identify the location and operating characteristics of BPL systems to facilitate the resolution of harmful interference should it occur.[17]

9. Petitions and Responses. Amperion, Current, and the UPLC request that the 30-day advance notification requirement be eliminated. Amperion states that the 30-day advance notification requirement is not practical and will not serve the Commission's intended purpose of facilitating interference mitigation and avoidance measures because a BPL operator will often have to dynamically shift frequencies in order not only to optimize the efficiency of BPL operations, but also to mitigate potential interference as quickly and accurately as possible. Amperion states that for these reasons, the precise frequencies in a given deployment area are rarely known 30 days in advance. It further states that the 30-

[14] See *Report and Order* at ¶¶ 74-87; *see also*, Public Notice DA 05-2701, released on October 13, 2005, in which the FCC announced that the United Telecom Council (UTC) will serve as database manager for Access BPL systems.

[15] Once the 30-day advance notification timeframe is over, the Access BPL operator can begin operations. However, the Access BPL operator must notify the database manager of the date of commencement of actual operations for inclusion in the database.

[16] 47 C.F.R. §§ 15.615(a)-(b).

[17] *See Report and Order* at ¶83.

day advance notice requirement could be interpreted as a requirement to discontinue service for 30 days after a change, and would thus discourage operators from shifting frequencies if necessary to optimize the system or prevent interference, and that this is contrary to the Commission's intention in adopting the database rule. Amperion and UPLC state that the 30-day advance notification requirement is redundant of other requirements because BPL operators are required in other rule sections to provide 30-day advance notice to Public Safety entities and Federal Government operations.[18] Current argues that the 30-day advance notification to the public database will not help radio licensees, as BPL would not be a cause of interference prior to its deployment. Current further states that this requirement could provide a competitive advantage to incumbent broadband providers who could use the notice of impending service to target the BPL installation area with unfair competitive tactics, such as predatory pricing or special offers in the particular areas served by BPL, or petitioning the local authorities to prohibit BPL deployments.[19] ACcess Broadband, Ambient and Ameren filed comments supporting the petitions to eliminate the 30-day advance notice requirement.

10. The AMA, ARRL, and Matda oppose elimination of the 30-day advance notification requirement. The AMA, whose members operate radio-controlled model aircrafts, argues that the Commission adopted the advance notice requirement not only to identify and resolve interference after it occurs, but to also avoid harmful interference before it occurs. AMA argues that without advance notice, BPL operations adjacent to a flying field could be set to operate on the same frequencies as those used by radio-controlled model aircraft operators and therefore may pose a risk to their flight operations.[20] The ARRL argues that elimination of the 30-day rules would contravene the intent of Sections 301 and 302 of the Communications Act to avoid interference beforehand. ARRL and Matda argue that absent the 30-day advance notice period, the ability to develop baseline measurements, and thus to determine the extent that the RF environment is degraded in a given area, would be gone. ARRL also considers Amperion's assertion that a change in frequencies might trigger a requirement to cease operation for 30 days to be frivolous. ARRL states that it may be necessary to change frequency bands several times, rapidly, in order to address individual problems, and, if so, the database will simply have to be changed.[21] It further states that Current and UPLC's arguments that the advance notification requirement would result in unwanted competition from other broadband providers is contrary to the entire basis for allowing BPL, which is to promote competition in broadband delivery.[22] AMA and Matda state that BPL operators will be marketing their services prior to operation and that in order to deploy, a BPL provider has had to sign contracts and negotiate with either power companies or local municipalities months in advance, and that equipment must be installed and tested to comply with the new regulations. They argue that these actions take time and are in full view of the general public, and thus competitors will clearly be able to see the intentions of the BPL provider in advance.[23]

11. Current states it has no reason to believe that the public safety licensees and utilities will not keep its information confidential.[24] It further argues that under the rules as adopted, the publicly accessible data base would provide a single information site where broadband competitors could routinely obtain advance notice of specific BPL deployments, which would be a significant advantage for those

[18] *See* Petitions of Amperion at 2-4 and UPLC at 5.

[19] *See* Petition of Current at 2-5.

[20] Opposition of AMA at 2-3.

[21] Consolidated opposition of ARRL at 7.

[22] *Id.*, at 3-8.

[23] *See* Oppositions of ACcess Broadband, Ambient and Ameren; *see also,* Oppositions of AMA at 3 and Matda (pages unnumbered.), and Consolidated Opposition of ARRL at 4-5.

[24] *See* Reply of Current at 3.

competitors, who otherwise would have to glean the information the hard way, by tracking BPL marketing campaigns. Current further states that since BPL operators have no comparable opportunities to ascertain the existing deployments of other broadband providers, let alone their proposed deployments, and since advance notice cannot help licensees to determine whether BPL is a potential source of interference, the 30-day advance notice requirement would competitively harm BPL operators without furthering any public interest.[25] Current also disputes the opposition's arguments that the Commission intended the 30-day advance notification requirement to be a vehicle for Amateur Radio Operators to perform before-and-after measurements or to contact the BPL provider in advance to the make their presence known. Current states that even if before-and-after testing were to show a small increase in the noise floor at a particular location after BPL is deployed, that finding itself would not require corrective action; a licensee has a valid complaint only if harmful interference occurs.[26]

12. ARINC, a provider of aviation communications and an aeronautical ground station licensee, asks that the Commission clarify that the advance notice requirements for public safety do not apply to changes in BPL systems needed to resolve harmful interference. Instead, it believes that BPL providers should be required to notify public safety licensees, including ARINC, within forty-eight hours of making the changes.[27]

13. Decision. The purpose of the database notification requirement is to ensure that licensed users of the spectrum have a publicly accessible and centralized source of information on BPL operations to determine whether there may be Access BPL operations on particular frequencies within their local area so that any incident of harmful interference can be resolved should it occur. We disagree with the UPLC and Amperion that the notification requirement is redundant of other requirements. In this respect, we note that in other rule sections, the BPL operator is required to consult and provide advance notice only to specific entities such as public safety and federal government operations. The BPL public database thus serves a unique function to identify the location and operating characteristics of BPL systems. We agree with Amperion that it may sometimes be difficult to disclose specific frequencies on which BPL operations are occurring 30 days in advance, because the BPL operator will have to shift frequencies based on the results of his consultations with affected licensed users and to maximize the efficiency of his operations.[28] Such changes could still be reported to the database within the 30-day time frame. We agree with AMA that it would be sufficient for the database notice to state the contemplated frequency range and later be amended when actual operating channels are identified.[29] We do not however intend for this 30-day time frame to be restarted if it is necessary for the reported frequencies to be changed as a result of negotiations with entities entitled to advance consultation. We therefore clarify that the Access BPL operator may change the reported frequencies in the database at any time during the 30-day advance notification period. We also clarify that this 30-day notification requirement only applies to initial Access BPL deployments. Thereafter, a BPL operator only needs to keep the information in the database current with respect to each of its deployment areas. We further clarify that systems operating prior to the effective date of the BPL rules need only provide and keep current the required information in the database; they are not required to cease operation for a 30-day period after that information is posted to the database.[30] In addition, we clarify that systems which operate under an experimental license are

[25] *Id.*

[26] *See* Reply of Current at 4-5.

[27] Comments of ARINC at 1-2.

[28] Petition of Amperion at 2.

[29] Opposition of AMA at 3.

[30] In its February 14, 2006 letter of complaint, ARRL argues that certain BPL systems placed in operation prior to their listing in the database should be required to be shut down and not recommence operation until 30 days after the date on which correct information appears in the database. *See* ARRL letter, February 14, 2006, at 4.

subject to the Commission's Part 5 rules, not the Part 15 BPL rules, and therefore are not required to be included in the Access BPL database.[31] In addition, interested parties are advised that in the case that non-compliance is identified, there is no implied requirement for the BPL system to "reset" the clock for an additional 30-day period, unless so ordered by the Commission. In the case where a BPL system transitions from an experimental license to commercial deployment under Part 15 of the rules, the system operator will only be required to notify the BPL database on the transition date; it will not be required to cease operation under the experimental license and wait an additional 30-day period to commence operation under Part 15.

14. Although we concur with Current that BPL would not be a cause of harmful interference prior to its deployment, we do not agree with Current's assertion that the 30-day advance notification requirement would provide a competitive advantage to other broadband providers. In this respect, we concur with the AMA that in order to deploy, the BPL operator has had to sign contracts and negotiate with power companies and other local and state authorities, and announce its deployment in marketing campaigns. We observe that a BPL service deployment will typically be planned far in advance and the installation and testing of BPL equipment placed on the power lines will occur publicly in that process, therefore, competitors will be aware of the introduction of the service. Further, the very general nature of the notification requirement in the database will not reveal any information that would benefit competitors to the detriment of the BPL operator.[32] Accordingly, we decline to eliminate the 30-day notification requirement to the public Access BPL database, as requested by the BPL industry.

15. Finally, ARINC is incorrect in its understanding that the rules require BPL providers to notify public safety licensees and other entities, including ARINC, every time changes in BPL systems are needed to resolve interference. We clarify that a BPL provider must notify and consult with the entities that are entitled to advance notification, as provided for in our rules, only before initial commencement of BPL operations. This will ensure that the subject entities have the opportunity to provide the BPL operator with information to adjust the operation of its systems. Subsequent changes will, presumably, be made with this information in mind. Accordingly, changes in existing BPL systems made for the purpose of interference resolution will only be required to be updated in the Access BPL database, which will provide adequate on-going information for all interested parties.

B. Transition Period

16. The rules adopted in the *Report and Order* require that all Access BPL devices that are manufactured, imported, marketed or installed 18 months or later after the Federal Register publication of the *Report and Order*, *i.e.*, after July 7, 2006, must comply with the newly adopted requirements of Subpart G of Part 15 for BPL devices, including certification of the equipment.[33] The Commission stated that the 18-month transition period would minimize economic hardships on BPL manufacturers by allowing them, during this transition period, to continue producing and selling existing equipment while modifying their future production to meet the new requirements. The Commission also noted that this transition period was typical of previous Commission transition periods for other Part 15 devices.[34]

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[31] In its March 25, 2006 letter of complaint, ARRL argues that the rules require BPL systems operating under an experimental license to comply with the BPL database requirements. *See* ARRL letter, March 25, 2006, at 3.

[32] The database notification only requires the name of the Access BPL provider, the frequencies of the Access BPL operation, the postal zip codes proposed to be served, the FCC ID of the BPL equipment being deployed, a point of contact and the proposed or actual date of deployment. *See* 47 C.F.R § 15.615(a).

[33] 47 C.F.R. §§ 15.37(l). The *Report and Order* was published in the Federal Register on January 7, 2005, thus the transition period would end on July 7, 2006.

[34] See *Report and Order* at ¶130.

17. Petitions and Responses. Current and the UPLC request that the transition deadline for the marketing and installation of Access BPL devices be extended until January 7, 2008.[35] They argue that the 18-month transition deadline is unnecessarily difficult for manufacturers and system builders. Current states that it is confident that it can meet the July 7, 2006, for manufacture and importation, but it foresees a problem with marketing and installing only newly certified equipment after the July 7, 2006 deadline. Specifically, Current states that under the July 2006 deadline, after allowing time for manufacture, shipping and stocking of new devices, BPL manufacturers would actually have only nine months of time to redesign, test, and complete the certification process for all of the devices needed in a BPL system.[36] Current further argues that in order to ship and install only compliant devices after July 7, 2006, BPL providers would have to empty the distribution pipeline of old products by that date and refill it with newly manufactured certified product, which could cause hardships of product scarcity during a period when deployments will be growing very fast.[37] Access and Ambient filed comments generally supporting the request to extend the transition period for non-compliant BPL equipment.

18. ARRL, ARINC and Ameren oppose these requests. ARRL states that the Commission erred in the *Report and Order* by permitting BPL devices that do not meet the newly adopted additional requirements to continue to be installed and operated for any period of time after the effective date of the new rules. ARINC and Ameren argue that because the BPL industry is still in a relatively nascent state, it is unlikely that the industry faces a surplus of unapproved equipment and that the BPL industry should not have to wait for BPL manufacturers to clear their inventories of old equipment before they can deploy the newly engineering BPL equipment.[38]

19. Current and UPLC reply that an extension of the deadline would instead fulfill the Commission's stated intent of minimizing economic hardships on manufacturers by allowing them to continue producing and selling existing equipment while preparing their products to meet the new requirements.[39] More recently,[40] Current has requested more narrowly that operators be able to install previously purchased equipment after the transition deadline in order to supplement existing installations. In this regard, it asserts that new equipment achieving certification under the rules will not be interchangeable with older systems, so that existing systems will be stagnated and will not even be able to replace faulty equipment without a complete system overhaul. It notes that the underlying non-interference requirement will continue to pertain and will adequately protect users of licensed service from harmful interference.

20. Decision. We disagree with ARRL's assertion that that the 18-month transition period will encourage the installation of non-compliant BPL equipment that causes harmful interference. In the *Report and Order*, the Commission concluded that the already existing emission limits will restrict Access BPL systems to very low power levels in comparison to the signals of licensed radio operations.[41] It stated that the effect of these limits will be to constrain the harmful interference potential to these systems to relatively short distances from the power lines that they occupy.[42] The Commission further recognized that some radio operations in the bands beings used by Access BPL, such as those of Amateur

[35] See Petitions of Current at 7-10 and UPLC at 6-7.

[36] Petition of Current at 8.

[37] *Id.*, at 2-3.

[38] Comments of ARINC at 3, Opposition of Ameren at 8, and Consolidated oppositionOpposition of ARRL at ¶14.

[39] *See* Reply of Current at 6-8 and UPLC at 3-5.

[40] See, *e.g.*, *Ex Parte* Communications of Current Technologies, June 5, 2006.

[41] *See Report and Order* at ¶38.

[42] *Id.*

radio licensees, may occur at distances sufficiently close to power lines as to make harmful interference a possibility.[43] It therefore adopted additional interference avoidance techniques for new BPL deployments such as the requirement for BPL systems to have remotely controlled power reduction capabilities and the ability to dynamically adjust operating frequencies. However, it is important to recognize that the fundamental emission limits are not changed by the *Report and Order*, nor is the fundamental requirement to mitigate any harmful interference caused by BPL, including shutting down the BPL system if necessary.[44] We therefore disagree with ARRL's assertion that equipment deployed during the transition period will result in harmful interference that cannot be eliminated. We reaffirm the Commission's finding that equipment deployed during the transition period that meets the former rules has a low likelihood of causing harmful interference in general, and that BPL operators are required to alleviate any harmful interference if it does occur. If interference requiring mitigation is more widespread in some areas than anticipated, we expect that prudent operators will employ the more capable equipment as a matter of sound business practice.

21. We are not persuaded by Current and UPLC that the July 7, 2006 cut-off date for the marketing and installation of BPL devices that comply with the new BPL rules should be changed. We are concerned about the possible installation of large inventories of Access BPL equipment that do not comply with the new rules if we lengthen the transition period as requested by Current. We continue to believe that an 18-month time frame should be adequate for the typical high-tech equipment and that the rules as adopted would ensure timely compliance of new Access BPL equipment and installations. We are not convinced that this deadline will place an undue hardship on BPL manufacturers as Current and UPLC have generally stated, as the 18-month time frame is adequate to ensure continuity in the supply of products. Further, we are committing to providing certification of BPL systems in a timely manner by the Commission, with no extraneous time added as a result of the equipment authorization process, as Current fears, and we hereby direct the Commission's Equipment Approval Unit to process such certification within a reasonable time. Accordingly, we are denying the petitions for reconsideration from Current and UPLC on the issue of a general extension of the equipment compliance deadline.

22. However, we note that BPL equipment manufacturers are only now submitting equipment for certification pursuant to the new rules, and we believe that some measure of relief is appropriate to permit the continued operation of existing systems. Accordingly, we will permit for one year from the effective date of this Order the installation of uncertified equipment that otherwise meets our Part 15 rules to replace or supplement equipment on existing systems within the areas already built out by those systems. We believe that this is a reasonable accommodation that will not appreciably affect our commitment to minimize the proliferation of noncompliant equipment. Our retention of the deadline for equipment certification for new system build-outs will continue to serve our goal of providing for interference mitigation capability.[45] There are a limited number of BPL operations at this time, and they are of modest scale. In those areas where BPL is functioning without interference concerns, it should not cause any harm to extend the period of attrition of that equipment and those systems for a limited period of time. In those locations where older equipment is the source interference concerns, those concerns must be adequately addressed, irrespective of the date of the equipment or its installation, and this provision will not exacerbate those situations.

C. BPL Technical Parameters

23. *Extrapolation factor.* In the *Report and* Order, the Commission specified measurement guidelines that require that BPL systems be tested *in situ* on three typical installations with overhead

[43] *Id.*

[44] *See* 47 C.F.R. 15.5

[45] *Report and Order, supra*, at 21291.

lines.[46] The measurement guidelines specify that measurements should normally be performed at a horizontal separation distance of 10 meters from the overhead line, or if necessary, due to ambient emissions, measurements may be performed at a distance of 3 meters.[47] In the *Report and Order,* the Commission recognized that at many *in situ* test locations, it may not be possible or practicable to measure at the proposed fixed distances of 10 and 3 meters.[48] For example, if a 10-meter distance places the measurement antenna on a roadway, safety may dictate increasing the distance to 14 meters in order to position the testers out of harm's way. Therefore, the Commission determined that distance extrapolation would be necessary for *in situ* testing. Some commenters in the proceeding recommended the use of an extrapolation factor of 20 dB per decade, while others recommended an extrapolation factor of 40 dB per decade.[49] The Commission stated in the *Report and Order* that "[g]iven the lack of conclusive experimental data pending large scale Access BPL deployments," it would "continue the use of the existing Part 15 distance extrapolation factors" specified in the rules, *i.e.*, 40 dB per decade, "but with the slant range rather than horizontal distance." [50] It further stated that "[i]f new information becomes available that alternative emission limit/distance standards or extrapolation factors would be more appropriate," the Commission, "will revisit this issue at another time."[51]

24. Petitions and Responses. In its petition, ARINC requests that we modify Section 15.31(f)(2) of the rules to require use of an extrapolation factor of 20 dB per decade, absent a clear showing that a higher factor should apply.[52] In support of its petition for reconsideration asking to rescind the new BPL rules pending further study, which is discussed later in this Order, ARRL states that the 40 dB per decade extrapolation factor for BPL systems operating below 30 MHz is unreasonable and incorrect, and should have been only 20 dB per decade.[53]

25. Current, Ameren, the HomePlug Powerline Alliance (HomePlug), Phonex Broadband Corporation (Phonex), SPiDCOM Technologies S.A. (SPiDCOM), the UPLC and Intellon Corporation (Intellon) object to changing the existing extrapolation factor from 40 dB per decade to 20 dB per decade as they contend that the record demonstrates the reasonableness of the 40 dB per decade factor. These parties argue that the petitioners did not demonstrate a need for the change except to repeat their previous arguments, and that the petitioners' request would unnecessarily hinder the deployment and use of BPL equipment across the nation.[54]

26. Decision. The extrapolation factor used for measurements of BPL emissions is an important consideration in determining compliance with the emission limits in the rules.[55] In the *Report and Order,*

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[46] *See Guidelines* in Appendix C of *Report and Order.*

[47] *Id.*, at 2(b)(1).

[48] *See Report and Order* at ¶109.

[49] *Id.*

[50] *See* 47 C.F.R. § 15.31(f)(1) and (2). "Decade", a 10:1 range, refers to the ratio of the specified measurement distance to the actual measurement distance.

[51] *See id.*

[52] Petition of ARINC at 6 & Appendix A, *BPL Interference Analysis.*

[53] Petition of ARRL at ¶44 & Exhibit E, *Analysis of Distance Extrapolation of Field Strength Calculated from the Antenna Models Provided to the FCC In the BPL Notice of Rulemaking Comments and Reply Comment; see also,* discussion in ¶¶43-53, *infra.*

[54] Opposition of Current at 19, Ameren at 1, HomePlug at 2, Phonex (pages unnumbered), SPiDCOM at 1, UPLC at 7, and Intellon at 2.

[55] If the extrapolation factor is 20 dB per decade instead of 40 dB per decade, the correction factor would be smaller, thus resulting in higher value for the transmitted emission levels. *See* 47 C.F.R. § 15.31(f)(1) and (2).

the Commission noted that NTIA's latest computer modeling shows that the variation of field strength with distance is consistent with the existing Part 15 distance extrapolation when used with the slant range distance to the power line as was proposed in Appendix C of the *Notice*.[56] The Commission also noted that although the ARRL and ARINC recommended the use of a 20 dB per decade extrapolation factor, rather than the existing 40 dB per decade in Part 15 for frequencies below 30 MHz, based on theoretical modeling, many parties, including AEC and Current, presented experimental data showing support for a 40 dB per decade decay rate of the field away from the line.[57] Finally, the Commission decided to use the existing Part 15 distance extrapolation factors in the rules for BPL due to the lack of conclusive experimental data pending large scale Access BPL deployments. The Commission also stated that, if new information becomes available that alternative emission limit/distance standards or extrapolation factors would be more appropriate, it would revisit this issue at another time.[58] No new information has been submitted that would provide a convincing argument for modifying this requirement at this time. Accordingly, we are retaining the existing extrapolation factor in the rules for the reasons set forth in the *Report and Order*.

27. *Required Notch Depth*. In the *Report and Order*, we determined that the most appropriate approach for ensuring that Access BPL systems are able to mitigate any instances of interference is to require that they incorporate the capability to avoid using specific frequency bands. In the rules, we therefore required that Access BPL systems have the capability to remotely reduce power and adjust operating frequencies to avoid site-specific, local use of the same spectrum used by licensed services. We further provided that these techniques may include adaptive, or "notch," filtering capability or complete avoidance of frequencies, or bands of frequencies, in specific local areas. Notch filters are required to be capable of attenuating emissions to a level at least 20 dB below the applicable Part 15 limits in the case of frequencies below 30 MHz and to a level at least 10 dB below the applicable Part 15 limits in the case of frequencies above 30 MHz. We also stated that we will generally assume that a 20 dB notch is sufficient to resolve any harmful interference that might occur to mobile operations, given both the low signal levels allowed under the Part 15 emission limits and the fact that a mobile transceiver is generally only in one place for a limited period and can readily be re-positioned to provide some separation from the Access BPL operation.[59]

28. Petitions. ARINC requests clarification that, if the use of the 20 dB notch depth does not solve a harmful interference issue, the BPL operator is obligated to take further action to avoid causing harmful interference.[60] To support its request for rescission of the BPL rules in its petition for reconsideration, which is discussed later in this Order, ARRL argues that the adopted rules are deficient because there is no technical analysis presented in the Report and Order to support the 20 dB notch depth.[61]

29. Decision. ARINC is correct that an Access BPL operator is required to ensure that its operations do not cause harmful interference to licensed operators and that, if a 20 dB notch is not sufficient to eliminate such interference in specific cases, the operator must take further actions to eliminate that interference to fixed licensed operations. With respect to ARRL's request for an

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[56] *See Report and Order* at ¶94; *see also*, NTIA Comments at 16-17 and letter of September 24, 2004 from Frederick R. Wentland, Associate Chief, NTIA Office of Spectrum Management, to Ed Thomas, Chief of the Commission's Office of Engineering and Technology.

[57] *See Report and Order* at ¶109.

[58] *Id.*

[59] *See Report and Order* at ¶65.

[60] Petition of ARINC at 5.

[61] Petition of ARRL at ¶38.

explanation of how we selected 20 dB as the level of attenuation that must be provided, we note that several factors were taken into consideration in reaching this decision. First, the Commission has long experience that unlicensed devices operating at the Part 15 limits generally do not cause harmful interference. In examining the performance of various Access BPL systems, our staff observed that if Access BPL emissions on frequencies below 30 MHz were reduced to 20 dB below the Part 15 limits, the potential for harmful interference to mobile HF reception in the vehicle used in their examinations would generally be limited to areas in close proximity of a BPL device or a power line carrying BPL signals except when signal margins are low.[62] Given the more stringent Part 15 emission limits that apply to Access BPL operations above 30 MHz, we stated that a notching capability of 10 dB is sufficient to provide the same level of protection above 30 MHz as a 20 dB notch below 30 MHz.

30. Upon review, we continue to find that the Commission's decision to assume that BPL emissions at or below the specified notching capabilities are sufficient to protect mobile operations is appropriate. The Part 15 radiated emission limit for Access BPL and other carrier current systems is 30 dBμV/m quasi-peak in a 9 kHz bandwidth at 30 meters for frequencies at or below 30 MHz .[63] When operating with a 20 dB notch below 30 MHz, the maximum allowed emissions from an Access BPL system is 10 dBμV/m at the Part 15 distance, which is at or only modestly above the noise floor in the HF bands.[64] In another words, Access BPL emissions would not be significantly greater than the background noise at the distances normally used for protection against harmful interference from Part 15 unlicensed devices.

31. We have also evaluated the potential for interference at closer distances that can occur when conducting mobile communications while traveling adjacent to roadside power lines. When extrapolated to values for the typical distance of a mobile antenna from roadside power lines (approximately 6 meters horizontal distance and 8.5 meters vertical distance, for a slant range of 10.4 meters) and adjusted for the typical quasi-peak to average ratio of 4 dB for BPL devices operating at high duty factor, the Part 15 limit corresponds to a root-mean squared (RMS) field strength of 44 dBμV/m for frequencies below at or below 30 MHz. A 20 dB reduction would limit emissions to 24 dBμV/m. While 24 dBμV/m is somewhat above the background noise level, however, we nonetheless conclude this is an appropriate value for several reasons.

32. The record and our observations indicate that the noise floor at HF in all areas is highly variable on the basis of both time and location.[65] Increases of 20 dB or more are quite common.[66] In addition to background noise, noise is also likely to be present from other sources, such as corona effects from power lines, nearby electric devices, and even the ignition system and electronics of the user's vehicle and other nearby vehicles. Propagation conditions also make the levels of the received signals

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[62] The test vehicle used was equipped with a sensitive amateur receiver and a roof-mounted whip-antenna.

[63] See 47 C.F.R. § 15.611(a). 9 kHz is a typical bandwidth for radiotelephone operations in the HF and MF bands.

[64] The nominal noise floor in the HF band, as recognized by the International Telecommunications Union, varies with frequency and population/commercial density (values are provided for business, residential, rural, and rural quiet areas). More specifically, the ITU median noise levels are 10 dBμV/m, 5 dBμV/m, 0 dBμV/m, and -7dBμV/m in business, residential, rural, and rural quiet areas, respectively, in a 9-kHz bandwidth at 30 MHz.

[65] At frequencies above 30 MHz, the Part 15 limit for class A devices (e.g., Access BPL operating on medium voltage lines) is 39 dBμV/m quasi-peak in a 120-kHz bandwidth at 10 meters distance. Adjusting for the 10.4-meter distance, 9-kHz bandwidth (based on an assumption of flat spectrum across 120 kHz bandwidth), and typical quasi-peak to average ratio discussed above, the limit corresponds to an RMS field strength of 23.5 dBμV/m at typical mobile radio distances from the power lines (20 dB lower than the effective limit below 30 MHz).

[66] *See e.g.*, comments of NTIA in response to the BPL Notice of Proposed Rule Making (filed Sep 8, 2004), in which it states that "[p]ower line noise resulting from ingress of ambient radio noise can vary by upwards of 20 dB throughout the day and seasonally, especially at frequencies below 12 MHz." NTIA Comments at 9.

vary considerably with time and location. Therefore, while mobile reception of relatively weak signals that would be affected by the presence of background noise levels under 24 dBμV/m is sometimes possible, such reception is generally intermittent and not reliable because both the received signal and the ambient noise levels vary up and down (the received signal and noise energy levels generally do not rise and fall together) as the vehicle moves.[67] Thus, because mobile HF service with relatively weak desired signals that would be affected by noise levels under 24 dBμV/m is generally not reliable, we do not consider increases in background noise resulting from BPL operations that are at or under this level to be harmful interference.[68] As stated in the Report and Order, we further point out that a mobile user can generally avoid a source of interference, whether it be from Access BPL, noisy power lines, or some other external, localized source, by simply relocating. We also observe that, in most instances, mobile users in motion do not remain in a location where they might be receiving interference.

33. Accordingly, we continue to find that it is appropriate to consider that Access BPL signals at levels below 24 dBμV/m will not constitute harmful interference to mobile, and in particular, amateur mobile communications. On balance, we conclude that the benefits of Access BPL for bringing broadband services to the public are sufficiently important and significant so as to outweigh the potential for a small increase in instances of disruptions that may arise to such mobile communications from low level Access BPL emissions. We therefore clarify that, except for mobile operations, Access BPL operators are responsible for resolving harmful interference that may occur even where their systems employ a 20/10 dB notch. Where an Access BPL operator implements such notching, we will not provide further protection to mobile operations, nor will we require the operator to resolve complaints of harmful interference to mobile operations by taking steps over and above implementing the "notch." We reiterate our intent, however, that cases involving actual interference from BPL operations be resolved without delay. When interference has been demonstrated, and has not been resolved through cooperative efforts by the BPL operator and the party receiving the interference, the Commission, through its Enforcement Bureau with assistance from the Office of Engineering and Technology, will review the complaint and take appropriate action in an expeditious manner.

34. *Protection of the amateur radio service.* On October 18, 2005, the ARRL filed a Petition for Issuance of Further Notice of Proposed Rule Making, in which it requests consideration of the same substantive points it submitted in its previous pleadings in this proceeding, *e.g.*, avoid use of amateur radio frequencies by Access BPL systems, avoid use of the HF frequencies by Access BPL systems on overhead medium voltage lines, and require use of a 20 dB extrapolation factor in place of the existing 40 dB extrapolation factor.[69] Although styled as a Petition for Further Notice of Proposed Rule Making," ARRL's pleading effectively constitutes a petition for reconsideration, as it seeks the same results previously sought by ARRL in this proceeding. We will therefore treat the Petition for FNPRM as a petition for reconsideration.

35. We deny ARRL's Petition for FNPRM. ARRL's asserts that its proposals would "remove

[67] To provide service, a desired signal generally must be received that exceeds background noise by a required signal-to-noise ratio (SNR). In the instant case, a signal at the 24 dBμV/m level in the presence of 24 dBμV/m of noise likely would not be receivable. The required SNR will be a function of the modulation method and the performance capabilities of the receiver. If the required SNR to provide service from a signal of a given type of modulation were 10 dB, for example, the minimum signal strength that could be received successfully would be 34 dBμV/m.

[68] We also note that fixed operations, in contrast to mobile operations, can be located at greater distances from power lines to avoid both power line noise and BPL emissions and are somewhat less susceptible to variability in the levels of both received and background noise.

[69] *See* Petition of ARRL for Issuance of Further Notice of Proposed Rule Making and for Amendments of Regulations (Petition of ARRL for FNPRM), filed on October 18, 2005. While late-filed as a petition for reconsideration, we will consider its substantive merits, as they are closely related to issues otherwise raised.

regulatory uncertainty and allow Access BPL to move forward unhindered by the interference problem that were [sic] inadequately addressed by the Report and Order."[70] As discussed herein, the rules adopted in the *Report and Order*, as modified by this *Memorandum Opinion and Order*, adequately address interference concerns and measurement procedures raised by Access BPL. ARRL also refers to "numerous cases of harmful interference to stations in the Amateur radio service"[71] and "extremely difficult-to-resolve incidents of interference to fixed and mobile Amateur radio facilities."[72] With respect to mobile stations, interference from Access BPL can often be avoided or reduced to an acceptable level by moving the mobile station only a short distance away from the power lines. We also have observed numerous instances where Access BPL systems have modified their operations to avoid use of amateur frequencies in the vicinity of amateur fixed stations. One "solution" proposed by ARRL in its Petition for FNPRM – the use of wireless links for connection to the home – is not Access BPL, and thus, while a permissible service, is not pertinent to this proceeding.[73] The other proposed "solution" – complete avoidance of all HF frequencies – would needlessly restrict BPL system design and reduce system capacity, without regard to whether there are amateurs that need protection from a particular BPL installation. This would result in a grossly inefficient utilization of Access BPL capacity, reducing the potential benefits of BPL and increasing its cost to the public, without a corresponding benefit or need. As indicated above, however, in cases where licensed radio service operators present meritorious claims of interference from a BPL system, we will expect the system operator take the necessary actions to resolve that interference in an expeditious manner. In cases where the system operator does not take expeditious action to resolve harmful interference, the Commission will review the complaint and take appropriate action. In light of the historic and ongoing importance of the amateur radio service – including and especially in emergency situations – the Commission will not allow harmful interference to such users to persist.

36. *Alternative method of emission measurements*. The BPL rules allow use of the measurement method recommended by NTIA as an alternative to the Commission's measurement guidelines.[74] The Commission's rules have historically allowed the use of alternative methods for compliance measurements, based on good engineering practices.[75] In the *Report and Order*, the Commission stated that NTIA's method of keeping the antenna height constant and applying a height correction factor is aimed at simplifying the measurement procedure; hence, this might be an alternative testing procedure that BPL providers may actually prefer.[76] However, the Commission also advised that the FCC and NTIA methods are mutually exclusive, *i.e.*, the BPL tester must choose either the NTIA alternative method or the FCC method, and cannot mix and match elements of the two.[77]

37. Petition. To support its request for rescission of the BPL rules, which is discussed later in

[70] October 18 Petition for FNPRM of ARRL at 5.

[71] *Id.*, at 4.

[72] *Id.*

[73] *Id.*, at 3. ARRL points out the characteristics of the Motorola Low-Voltage BPL system. However, that system is not Access BPL, as it only uses the low-voltage power lines from the distribution transformer to the house – much like In-House BPL systems – and distributes signals within and across the system by wireless RF.

[74] *See* NTIA Report 04-413, *Potential Interference From Broadband Over Power Line (BPL) Systems To Federal Government Radiocommunications at 1.7-80 MHz, Phase 1 Study, Volume I*, National Telecommunications and Information Administration, filed April 27, 2004; *see also, Report and Order* at ¶110.

[75] *See* 47 C.F.R § 15.31(b).

[76] *See Report and Order* at ¶110.

[77] *Id.*

this Order,[78] the ARRL contends that there should be only one measurement standard; otherwise, there will be substantial differences in maximum radiated emission levels calculated, depending on the method used, and no objective means of evaluating a system for compliance. It further states that permitting use of multiple standards allows BPL operators to choose the method that more readily qualifies their equipment for authorization.[79]

38. Decision. We note that the adopted methods of measurement were thoroughly discussed in the *Report and Order*.[80] The Commission specifically allowed each method to be used individually, and stated that the methods are mutually exclusive.[81] A BPL provider choosing to use the first method must test its system with slant range distances and height variation of the measuring antenna from 1 to 4 meters for frequencies above 30 MHz. In the alternative, a BPL provider may choose to measure at an antenna height of 1 meter, but would have to add a correction factor of 5 dB. One method must be selected, and elements of the two may not combined. We expect the methods to provide similar results, and find that either will adequately assure compliance with our rules. We note that the Commission has traditionally allowed the use of any alternative method for determining compliance, as long as it is based on good engineering practices. Accordingly, we deny ARRL's petition on this issue.

39. *Other technical requests.* A number of parties petition for the inclusion of new technical restrictions in the Access BPL rules. McVey requests that BPL systems be required to employ continuous monitoring and feedback schemes to ensure that signal levels are not exceeded within geographic zones because distribution lines are affected by different loads and voltage stepping.[82] CDE states that "the effect of weather on power line noise is well documented...[t]he Commission in its effort to establish a new service has not indicated how measurements of system performance in areas where weather is a factor are to be treated."[83] Davis requests that we clarify the definition of harmful interference as it relates to the amateur radio service and that we provide clear assurance that all types of routine communications, including weak signal communications, be protected from harmful interference.[84] NAC/Amherst requests that new proposed rules not be issued until all on-going studies of BPL by NTIA have been fully completed and publicly disclosed, including a comprehensive study of ionospheric propagation of BPL signals.[85]

40. In opposition, Current, Ameren, and UPLC urge the Commission not to take any action on reconsideration which might delay the rapid development of the full potential of BPL or reduce the opportunities for BPL to develop as a realistic competitive alternative to cable and DSL.[86] Current also states that the Commission based its rules on adequate data, and that its decision was reasonable in view

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[78] *See* discussion in ¶¶43, *infra*.

[79] Petition of ARRL at ¶45.

[80] *Report and Order* at ¶¶107-110. In the case of Access BPL emission measurements, NTIA confirmed that "at frequencies above 30 MHz, NTIA's computer modeling results show that increases of field strength with height are properly captured either by varying the measurement antenna height between one and four meters as proposed by the Commission or by using a one meter antenna height with a 5 dB height correction factor as proposed by NTIA." *See* letter of September 24, 2004 from Frederick R. Wentland, Associate Chief, NTIA Office of Spectrum Management, to Ed Thomas, Chief of the Commission's Office of Engineering and Technology, at 2.

[81] *Id.*

[82] Petition of McVey at 4.

[83] Petition of CDE at 3.

[84] Petition of Davis (pages unnumbered).

[85] Petition of NAC/Amherst at 23.

[86] Opposition of Current at 15, Ameren at 10, Ambient at 4, and UPLC at 1.

of the safeguards adopted in the required mitigation procedures and the significant benefits of BPL deployments.[87] Current further argues that the reflection phenomena in ionospheric propagation can increase the useful range of a short-wave station operating at hundreds or thousands of watts, but would not have any effect on BPL signals operating at the required Part 15 low emission levels.[88]

41. Decision. With regard to additional monitoring and feedback requirements, we note that BPL systems are already required to comply with the rules under all line impedances and loads and weather conditions, and the rules provide no exception for these conditions. We have no basis to presume that continuous monitoring and feedback is necessary to maintain this compliance, and thus see no need to impose this burden on BPL system operators. Accordingly, we deny the requests of McVey and CDE for such further rules. In addition, as discussed in the *Report and Order,* we continue to believe that only communications of dedicated public safety agencies and similar organizations warrant the additional special protections beyond the general Part 15 provisions that apply to amateur and other radio operations. The general Part 15 provisions are sufficient to protect amateur operations; hence, no specific clarification for weak signals or other types of communications is necessary with regard to the definition of "harmful interference" in our rules.[89] Accordingly, we also deny the request of Davis on this issue.

42. Further, with respect to ionospheric propagation, we note that NAC/Amherst simply reiterates the same arguments that it previously submitted in the record. The Commission's decision in the *Report and Order* was in part based on NTIA's recommendation that, on the basis of worst-case oriented analyses of ionospheric propagation and aggregation of radiated emissions from Access BPL systems, ionospheric propagation is not a potential near-term issue that should delay adoption of BPL rules.[90] NAC/Amherst provides no new information; accordingly, we are dismissing its petition on this issue.

D. Further Study of Access BPL characteristics

43. As indicated, *supra,* the ARRL, a number of radio amateurs, Davis, Matda, McVey, Richmond, Whedbee and NAC/Amherst, request that we rescind the rules governing Access BPL systems and prohibit BPL deployments pending further re-study of Access BPL interference characteristics.[91]

44. Petitions and Responses. In its petition, ARRL first alleges that the Commission prejudged the proceeding and failed to conduct impartial and reasoned rulemaking, which violates the Administrative Procedure Act's (APA) reasoned decision making requirements.[92] It contends that examples of such prejudice include FCC Chairman Powell's alleged *ex parte* violation leading to prejudgment of the outcome of the proceeding, alleged Commission mishandling of the ARRL's Freedom of Information Act (FOIA) request by responding belatedly and redacting internal discussion sections from the released information, and alleged Commission failure to analyze the complete record fairly and to thoroughly evaluate Access BPL's interference potential.[93] The ARRL contends that the Commission

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[87] Opposition of Current at 7.

[88] *Id*, at 8.

[89] *See Report and Order* at ¶53; *see also,* 47 C.F.R. §2.1. Section 2.1 defines harmful interference as "[I]nterference which endangers the functioning of a radionavigation service or of other safety services or seriously degrades, obstructs, or repeatedly interrupts a radiocommunication service operating in accordance with these [international] Radio Regulations. (RR)."

[90] *Report and Order* at ¶11; *see also,* comments of NTIA filed June 4, 2004, at 10.

[91] Petitions of ARRL, Matda, NAC/Amherst and Richmond.

[92] *See* Administrative Procedure Act, codified as amended by Pub. L. No. 89-554, 80 Stat. 381, at 5 U.S.C. §§ 551-559. 701-706, 1305, 3105, 3344, 5372 and 7521.

[93] Petition of ARRL at ¶¶11-12, and ¶¶16-18; *see also,* Matda petition (pages unnumbered).

had no record basis for certain of its assertions which underlie its conclusions. It specifically points to three statements in the Report and Order: "'The record and our investigations indicate that BPL network systems can generally be configured and managed to minimize and/or eliminate this harmful interference potential'"[94]; "'[b]ased on extensive research, analysis and practical experience, we also continue to believe that the interference concerns of licensed radio users can be adequately addressed' [and] from the information provided by our 'field tests'... we observe that the potential for any harmful interference is limited ..."[95]; and "Moreover, the NTIA Phase I field study 'and our own field measurements' of Access BPL installations indicate that these systems are not efficient radiators, nor are their emissions cumulative such that they permeate areas in which they are located."[96] Next, ARRL asserts that the Commission failed to devise rules that adequately protect licensed services. To this end, it argues that the adopted mitigation rules are ineffective and applied inequitably, which is leading to discriminatory treatment of the amateur service; that the Commission failed to respond to complaints of interference; and that the adopted measurement standards are erroneous, while the allowed alternative measurement procedure using NTIA's method leads to substantial differences in results, with no objective means for determining compliance.[97] It further argues that the required content of the public database does not address instances of mobile radio interference and that public safety communications are not protected by this requirement.[98] Finally, ARRL alleges that the Commission's balancing of BPL benefits against increased interference risks is unlawful under Section 301 of the Communications Act.[99] The requests of individual amateurs are similar to the ARRL's concerns.

45. In its opposition filing, Current argues that the amateur petitions generally seek near-absolute interference protection, whereas Part 15 requires only that equipment such as BPL eliminate a significant risk of "harmful interference.[100] Current further states that the Commission based its rules on adequate data, and that the Commission's decision was reasonable in view of the safeguards embodied in the required mitigation procedures and the significant benefits of BPL deployments. In general, the BPL industry urges the Commission to avoid any action on reconsideration which might delay the rapid development of the full potential of BPL or reduce the opportunities for BPL to develop as a realistic competitive alternative to cable and DSL.[101]

46. Decision. *a) Reasoned Decision Making.* We note first of all that the Commission's Office of General Counsel (OGC) has determined that Chairman Powell's visit to the Manassas BPL demonstration was not prohibited by the Commission's *ex parte* rules.[102] Furthermore, the Manassas demonstration during Chairman Powell's visit did not provide any new information that would have had a substantive bearing on the Commission's decision regarding BPL. Hence, no prejudicial contact occurred as a result of this visit.

47. Next, we note that the Commission's FOIA response to ARRL clearly stated that the redacted portions of the FOIA's content referred to internal communications that were not relied upon in the

[94] *Report and Order* at ¶2.

[95] *Id.*, at ¶23.

[96] *Id.*, at ¶39.

[97] *Id.*, at ¶¶30-38, ¶41, and ¶¶42-45. This issue is addressed in ¶¶38, *supra.*

[98] *Id.*, at ¶40.

[99] *Id.*, at ¶¶22-29.

[100] Current cites Section 15.5 and 15.611(c) of the rules. *See* 47 C.F.R. §§ 15.5 and 15.611(c).

[101] *See, e.g.*, Opposition of Current at 15, Ameren at 10, and Ambient at 4.

[102] *Report and Order* at ¶137; *see also,* Letter from the FCC to ARRL, dated October 14, 2004, and 47 C.F.R. §§ 1.1200-1.1216.

decision making process.[103] We clarify that in this proceeding, the Commission relied, in the aggregate, on NTIA's BPL Phase 1 Report, on the various interference studies filed in the record, including ARRL's studies, and on its own internally conducted studies as described in the materials provided in the FOIA response to ARRL, in deciding on additional requirements for BPL systems over and above the Part 15 requirements for low-power unlicensed devices in these bands.[104] Because these studies and comments raised concerns of interference at some distances down the power lines from the BPL equipment injection point on the power line, the Commission adopted a rigorous radiated emissions measurement method to ensure that BPL emissions are accurately evaluated so that interference mitigation solutions are applied where needed.

48. ARRL contends that the NTIA study points to possible interference from Access BPL systems to land vehicle, boat and fixed stations in areas up to 75 meters, 100 meters, and 460 meters from the power lines, and argues that the Commission ignored such data.[105] Contrary to ARRL's assertion, the Commission did consider those findings. We believe that the issue is adequately addressed by the various additional requirements that we placed on Access BPL systems. Those additional requirements include notching and frequency agility, consultation with licensed users, avoidance of operation in exclusion zones on certain excluded frequencies, Access BPL location identification in a public database, and an extensive method of measurement to determine compliance with our rules.[106]

49. We also clarify that the Commission's statements in paragraphs 2, 23 and 39 of the *Report and Order* point to its extensive experience with carrier current systems over the past decades, its review and investigation of the field testing of NTIA in the BPL Phase 1 study, and its own field investigations of BPL experimental sites.[107] We note that although in adopting the *Report and Order,* the Commission did not agree with ARRL's arguments to prohibit BPL operations, the Commission recognized the concerns raised by ARRL and other licensed radio users and provided a reasoned basis for its BPL decisions affecting other radio licensees.[108] Accordingly, the Commission's decision was in full compliance with the APA.

50. *b) Adequate protection of licensed services.* We disagree with the ARRL's assertion that the Access BPL rules adopted by the Commission do not adequately protect licensed radio services. First, the BPL rules require Access BPL systems to incorporate adaptive interference mitigation techniques for the protection of licensed radio services. These requirements are not imposed on any other Part 15 devices and are specific to Access BPL systems, because the Commission decided that the record,

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[103] *See* Letter from the Office of Engineering and Technology, filed December 22, 2004, at 2.

[104] *See, e.g.,* NTIA Report 04-413, *Potential Interference From Broadband Over Power Line (BPL) Systems To Federal Government Radiocommunications at 1.7-80 MHz, Phase 1 Study, Volume I,* National Telecommunications and Information Administration, (NTIA BPL Phase 1 Report), filed April 27, 2004. ARRL's technical studies appended to its comments filed on June 3, 2004, Exhibit A - "BPL Trial Systems Electromagnetic Emission Tests," by Metavox, Inc., of Dulles, Virginia; Exhibit B - "Interference Assessment of PLC Compatibility with Allocated HF Systems," by Dr. David Cohen of the University of Maryland; and Exhibit C - "Proposed Radiated Emission Limits and Extrapolation," by ARRL Chief Technology Officer Paul Rinaldo; *see also, Report and Order* at ¶39.

[105] ARRL petition at ¶18, citing NTIA BPL Phase 1 Report, Executive Summary, at p. vi.

[106] *Report and Order* at ¶107-109. Note also that the BPL measurement method adopted by the Commission requires testing at several points to capture the interference contour of a BPL system. Under these provisions, measurements must be taken in certain cases at more than 100 meters down the power line from the BPL injection point, to ensure that locations of maximum emissions are found and evaluated for compliance.

[107] *See* Petition of ARRL at ¶15, stating that the FOIA's released data did not support the Commission's reference to "investigations", "extensive research, analyses and practical experience" and "Commission's own field measurements."

[108] *Report and Order* at ¶¶23-25, and ¶¶49-53.

including ARRL's interference studies, pointed to a potentially greater harmful interference risk from these systems.[109] Further, Access BPL systems are also the only carrier current systems required to be authorized under the Commission's equipment *Certification* procedure.[110] In addition, the BPL operators must provide information on their systems in a publicly accessible database; and for those licensed users whose operations are critical in nature or safety-of-life related, such as public safety, the rules also require advance consultation and notification.[111] Thus, contrary to allegations of ARRL and individual radio amateurs, the Commission carefully considered the possible effects of BPL operations on licensed services and provided for their protection.[112] The reasons that the Commission decided not to prohibit BPL operations on amateur frequencies were also fully explained in the *Report and Order*.[113] As Current observes, the Commission based its rules on adequate data, and its decision was reasonable in view of the safeguards provided by the required mitigation procedures.[114] Amateur services, and all other radio services, except public safety and certain sensitive government operations which are afforded additional protection for reasons enumerated in the *Report and Order*, are protected equally by the mitigation techniques and other operational restrictions adopted in the BPL rules.[115] Accordingly, we conclude that the amateur service is treated on an equal footing with other similarly situated radio services (*e.g.*, Citizens Band (CB) radio, HF broadcast radio, and television channels 2, 3 and 4) and ARRL's allegation of discrimination against the amateur service is without merit.

51. We also disagree with ARRL's assertion that allegations of interference at some experimental BPL sites demonstrate that the adopted mitigation rules are ineffective. The BPL rules adopted in the *Report and Order* must be given time to be implemented. Access BPL equipment currently deployed is typically not designed to fully incorporate the interference mitigation capabilities set forth in the rules that we have put in place. Therefore, until Access BPL operators implement all of the required mitigation techniques, we find that it is premature to conclude that these rules are ineffective. We note, importantly, that BPL systems are required to mitigate interference irrespective of the generation of equipment in use. We also believe based on the record and our observations that the interference potential of Access BPL systems to licensed users can be adequately mitigated by the unique additional requirements that we placed on Access BPL devices, but if, as the service develops, interference becomes a problem, we will revisit the issue.[116]

52. We further disagree with ARRL and amateur commenters that the BPL rules should be rescinded because the Commission has failed to respond to complaints of interference.[117] Under Section

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[109] *See, e.g., Report and Order* at ¶49.

[110] *See* 47 C.F.R. § 15.101(a). The *Certification* procedure requires that a formal application with supporting test data and documentation be submitted to the Commission for review and approval. All other carrier current systems, including In-House BPL, are subject to the *Verification* procedure, in which the BPL manufacturer attests to compliance and no test results are submitted to the Commission for review.

[111] *See* 47 C.F.R. § 15.615.

[112] *See* petition of Matda (pages unnumbered) and McVey at 7.

[113] *Report and Order* at ¶53.

[114] Opposition of Current at 7.

[115] *Report and Order* at ¶¶49-52.

[116] The rules we put in place further subject Access BPL systems to additional limitations not required of any other unlicensed equipment: notching and frequency agility, consultation with licensed users, avoidance of operation in exclusion zones on certain excluded frequencies, Access BPL location identification in a public database, and an extensive method of measurement to determine compliance with our rules. Taken together, these provisions will minimize instances of harmful interference from Access BPL to authorized radio services. *See* 47 C.F.R. §15.615.

[117] Petitions of ARRL at ¶41 and McVey at 7.

15.5(c) of the rules and as described in the *Report and Order*, parties who believe they are experiencing interference from an unlicensed device are first expected to bring the matter to the attention of the operator of the unlicensed device.[118] If that action does not resolve the interference, the party may then seek intervention by the Commission. Where BPL interference complaints have been filed by a licensee with the Commission, the Commission has followed the procedure outlined in the *Report and Order* and contacted both the complainant and the BPL provider to determine if the parties have first attempted to resolve the interference complaint among themselves.[119] In cases where they have not made such an attempt, the complainant has been asked to work with the BPL provider to determine if the interference being experienced is from the BPL system and, if so, to have the BPL provider take appropriate action to eliminate the interference.[120] We will continue to require BPL providers to comply with this process where licensed radio operators make meritorious claims of interference from BPL operations.

53. We also note that ARRL's contention regarding the insufficiency of the public database with respect to protection for mobile users was discussed and analyzed in the *Report and Order*.[121] The Commission decided that the database's primary function is to provide a centralized repository of information with a single point of contact for resolving interference complaints. It can do this as well for mobile stations that receive interference as for fixed stations. The Commission also determined that unlike fixed stations, a mobile transceiver can be re-positioned to provide some separation from the Access BPL operation that will eliminate any harmful interference that may occur.[122] As for ARRL's argument that public safety communications are not protected by the database rule, we note that the rules already provide special protection for public safety services by requiring the BPL operator to consult in advance with local public safety users and to ensure response to public safety interference complaints within 24 hours of receipt of the complaint. Accordingly ARRL's allegation that mobile users and public safety communications are not protected by the BPL database rule is without merit, and we deny ARRL's request in this regard.

54. *c) Commission's statutory responsibility under the Communications Act.* To support its request that BPL rules be rescinded, ARRL argues that a balancing test of interference risks is prohibited under current spectrum allocation paradigms and the licensing requirements of Section 301 of the Communications Act, and that there is no statutory underpinning for the application of a "balancing test" involving interference from unlicensed facilities to licensed radio services.[123] We observe at the outset that Access BPL systems are not radio communications systems but rather are systems which in their operation are capable of emitting RF energy that can cause harmful interference to radio communications. As such, BPL systems fall under the Commission's jurisdiction as conferred by Section 302 of the Communications Act, rather than Section 301.[124] Consistent with Section 302, the Commission may

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[118] 47 C.F.R. § 15.5(c). *See also, Report and Order* at ¶¶59 & 60.

[119] *Id.*

[120] Generally, the Commission does not intervene while the parties are cooperating to solve the issue in good faith. We further observe that a number of initial BPL deployments operated under experimental licenses which gave operators the option to experiment with different levels of power, including levels higher than allowed under Part 15. Furthermore, some of these early systems did not have the capability to retain their programmed mitigation settings after a power failure or shut-off condition, which might have accounted for some complaints from the amateur community. However, the adopted rules require BPL systems to be designed with a non-volatile memory so that previous settings with programmed notches and excluded bands are immediately restored upon start-up, after a shut-off procedure of any cause. *See* 47 C.F.R. § 15.611(c)(2).

[121] *See Report and Order* at ¶¶81-83 for the database discussion and ¶66 for discussion on mobile users.

[122] *Id.*, at ¶66.

[123] *See* Petition of ARRL at ¶¶15 & 25, citing ¶23 of *Report and Order; see also*, 47 U.S.C §§ 301 and 302.

[124] 47 U.S.C. § 302 (a)(1).

adopt reasonable regulations governing the interference potential of BPL systems, which, as unintentional radiators, communicate by sending RF energy by conduction down the power line, not over the air.[125] The Commission is also within its statutory authority to determine whether such regulations are consistent with the public interest, convenience and necessity.

55. In the instant proceeding, the Commission has determined that any potential for harmful interference from Access BPL systems operating in compliance with the existing Part 15 emission limits for carrier current systems could be controlled by the additional Part 15 Access BPL rules that were adopted. It also determined that the public interest would be served by encouraging BPL deployment and growth, which would bring broadband access to new areas of the country and promote competition in the broadband market, leading to lower prices and higher productivity for the American public.[126] Therefore, when the Commission stated, in the *Report and Order*, that on balance, the benefits of Access BPL for bringing broadband services to the public are sufficiently important and significant so as to outweigh the limited potential for increased harmful interference that may arise, it weighed the public interest, convenience and necessity in adopting reasonable regulations to effectively control the harmful interference potential of Access BPL, consistent with Section 302.[127] Accordingly, we find that ARRL's arguments that the Commission's balancing of the benefits of BPL against the risk of interference to licensed radio services was unlawful are without merit.

56. Finally, we note that BPL systems are already allowed to be deployed under the existing Part 15 carrier current systems requirements, and the Commission has taken a pro-active and protective approach in the *Report and Order* by placing additional technical and operational restrictions on these systems, in order to provide a higher level of pre-emptive protection to licensed radio services, including the amateur service. We therefore find that the requests of the amateurs and others to rescind the adopted Access BPL rules would in effect leave licensed radio users with less protection against potential interference, as BPL systems may continue to be deployed under the carrier current rules of Part 15 prior to the adoption of the new BPL rules. ARRL, Davis, Matda, McVey, Richmond, Whedbee and NAC/Amherst have not provided any new information that would persuade us to change our decision. Accordingly, we deny the petitions from these parties.

E. Other Requests

57. *Federal Government radio astronomy facility.* The Part 15 rules require Access BPL systems to avoid operating on the 73.0 – 74.6 MHz band used by the ten Very Long Baseline Array facilities of radio astronomy observatories within specific distances.[128] This requirement is intended to protect these sensitive federal government operations from potential interference.

58. Petition. NTIA, on behalf of the National Foundation of Science (NSF), requests that we add an exclusion area, in the 73.0 to 74.6 MHz band, for a Very Large Array (VLA) radio astronomy observatory in New Mexico, and that we modify the protection for the ten Very Long Baseline Array

[125] "The Commission may, consistent with the public interest, convenience, and necessity, make reasonable regulations (1) governing the interference potential of devices which in their operation are capable of emitting radio frequency energy by radiation, conduction, or other means in sufficient degree to cause harmful interference to radio communications;..." 47 U.S.C. § 302(a).

[126] *Report and Order* at ¶23.

[127] *Id.* at ¶24.

[128] 47 C.F.R. §16.515(2)(ii). The rules require Access BPL systems using overhead medium voltage lines to avoid operating in the 73.0-74.6 MHz within 29 km of the coordinates of the ten VLBA facilities listed in 47 C.F.R. § 2.106, note US311, and within 11 km of those coordinates if the system uses overhead low voltage lines or underground power lines.

(VLBA) sites that are currently listed in the rules.[129] NTIA's request states that the NSF has now determined that the exclusion zones at the ten VLBA sites are not needed and that an exclusion area for the VLA site in New Mexico is required. NTIA requests that Access BPL systems operating in the 73.0 to 74.6 MHz band on overhead medium voltage power lines be excluded within 65 km of the coordinates of the VLA facility, and that Access BPL systems using low voltage or underground power lines operating in the 73.0 to 74.6 MHz band be excluded within 47 km from the coordinates of the VLA facility. The coordinate at the center of the VLA is 34° 04' 43.50"N, 107° 37' 03.82"W.[130] NTIA observes that that deleting the exclusion areas for the 73.0-74.6 MHz radioastronomy observatories as it now requests would result in no special protection of those facilities and therefore asks that we extend the frequency range of the consultation areas for radioastronomy observatories from the current range of 1.7-38.25 MHz to the range of 1.7-80 MHz.

59. Decision. No party has contested these changes, and we will modify our rules as requested by NTIA. Accordingly, we will not maintain exclusion zones around the sites where NTIA no longer considers BPL to be an interference threat and will extend the frequency range of the consultation areas for radioastronomy observatories from the current range of 1.7-38.25 MHz to the range of 1.7-80 MHz. We will also provide an exclusion zone around the VLA radioastronomy observatory in New Mexico, at the specific coordinates of 34° 04' 43.50" N, 107° 37' 03.82" W.

60. *Aeronautical service.* In order to protect aeronautical operations, Access BPL systems on medium voltage lines are required to avoid operating in the frequency bands reserved for Aeronautical (R) frequencies and in the 74.8-75.2 MHz band.[131] This requirement is intended to protect international aeronautical safety operations and aircraft receivers from potential interference.

61. Petition and Responses. ARINC urges that the exclusion of BPL operations in the 74.8-75.2 MHz band on overhead medium-voltage lines be extended to encompass Access BPL systems and In-House BPL systems operating on overhead low-voltage power lines.[132] To support this request, ARINC states that carrier current devices employed to provide the transmission of telephone communications within a houses over their wiring appear to have been responsible for interference to ARINC's HF ground station.[133] Thus, it argues that the new rules did not adequately consider the potential threat that BPL operating on low voltage lines pose to high-frequency (HF) aeronautical communications.[134]

62. ARINC further petitions that we require BPL operators to cooperate in adjusting their system parameters if such adjustments are necessary to protect new or relocated aeronautical facilities.[135] ARINC states that, similar to U.S. Coast Guard stations, which the rules specifically protect, its stations may also be relocated in the future.[136] ARINC requests that we modify the rules to clearly address this situation. Finally, ARINC advises us that the coordinates for some of its sites are incorrect and provides the correct

[129] *See* Letter of February 14, 2005 from Frederick R. Wentland, Associate Administrator, NTIA Office of Spectrum Management, to Ed Thomas, Chief of the Commission's Office of Engineering and Technology; *see also* letter of July 12, 2006 from Fred Wentland, Associate Administrator, NTIA Office of Spectrum Management, to Julius P. Knapp, Deputy Chief, Federal Communications Commission Office of Engineering and Technology.

[130] *Id.*, at 1.

[131] 47 C.F.R. §15.615(f)(1), Table 1.

[132] ARINC petition at 1.

[133] *Id.*, at 4.

[134] *Id.* The High Frequency (HF) band covers frequencies from 3 to 30 MHz.

[135] *Id.* at 9.

[136] 47 C.F.R. § 15.615(f)(1)(ii).

information. It also provides new email contacts for the ARINC sites subject to BPL consultation under Section 15.615.[137]

63. Intellon, HomePlug, Phonex, Ameren et al., Ambient, UPLC and Current all oppose ARINC's petition.[138] These parties argue that there is no evidence justifying the imposition of new requirements on In-House BPL systems. They note that ARINC continues to reiterate a complaint of interference from a narrow-band carrier current system at a single site where it even admits the interference has been mitigated.[139] They contend that there are several hundred thousands of In-House BPL devices being used in the U.S. market that have not been shown to cause interference.[140]

64. Decision. We note that in the *Report and Order,* the Commission carefully analyzed the emission characteristics of the low-voltage feed lines and determined that the interference potential from these lines is generally lower than that of overhead medium voltage lines. It observed that such lines are typically used only for short feeder links from a transformer to a customer service location, are more closely spaced with an accompanying neutral line, and in fact are often twisted together with the neutral line. The Commission determined that the close spacing of these wires, together with their shorter length, reduce radiated RF emissions relative to those from overhead medium voltage lines.[141] As the BPL industry representatives point out, there has not been any verified complaint regarding interference caused by In-House BPL devices, despite their widespread availability since 2002. The Commission's Enforcement Bureau investigated the case of interference allegedly caused by a carrier current system alluded to in ARINC's petition and did not find that interference was caused by a Part 15 device.[142] Based on the lack of interference complaints from widely deployed BPL systems operating on low-voltage lines, we determine that they do not pose a high risk of harmful interference. Accordingly, we deny ARINC's request to require In-House BPL systems and Access BPL systems operating over low-voltage lines to exclude the Aeronautical (R) frequencies and the 74.8-75.2 MHz band.

65. We agree with ARINC, however, that continued cooperation from BPL operators at new or relocated aeronautical facilities is desirable, and are amending the rules to require that system operators work with aeronautical facilities operators as necessary to adjust BPL operating parameters to protect new or relocated aeronautical facilities. We also are amending the Part 15 rules to incorporate the editorial changes requested by ARINC regarding the coordinates and email contact for the ARINC sites subject to BPL consultation in Section 15.615. Accordingly, we grant in part and deny in part ARINC's petition to the extent indicated herein.

66. *Broadcast television service.* The Part 15 rules allow Access BPL systems to operate between 1.7 and 80 MHz, over medium or low voltage lines.[143] Television channels 2 to 5 are located within the bands from 54 MHz to 82 MHz. To date, no Access BPL systems have been designed to operate on frequencies above 50 MHz.

67. Petition and Responses. MSTV requests that we confine BPL operations to frequencies

[137] 47 C.F.R. § 15.615(f)(3), Table 3b.

[138] Opposition of Intellon at 7, HomePlug at 7, Phonex (pages unnumbered), UPLC at 6, and Current at 14-15.

[139] *See* Opposition of Intellon at 4 and HomePlug at 4.

[140] *See* Response of Phonex (pages unnumbered) and Opposition of Intellon at 8.

[141] *Report and Order* at ¶49.

[142] *See Memorandum* from Joseph Casey, Enforcement Bureau, to Bruce Franca, Office of Engineering and Technology, Federal Communications Commission, filed in ET Docket Nos. 03-104 & 04-37, on January 27, 2004.

[143] 47 C.F.R. §15.601.

below 50 MHz to avoid significant disruptions to the digital television (DTV) transition.[144] MSTV submits a new study, the *BPL-Television Study*, which was completed in February 2005, after the BPL rules were adopted, to support its claim that even Part 15-compliant Access BPL signals can cause material interference to television channels 2 to 5 and allege that the effect would be to render these channels unusable in many realistic cases.[145]

68. In the Technical Appendix to its opposition comments, Current analyzes MSTV's *BPL-Television Study* and states that an error in the study results in its overstating the interference potential by 50 dB because the study uses a continuous wave (CW) unmodulated signal at the center of each TV channel allocation, whereas BPL signals are multi-frequency signals spread across a wide bandwidth at much lower power levels.[146] The UPLC concurs with Current's assessment and argues that MSTV's claims of interference are speculative, as MSTV itself admitted in its study that "[t]here was lack of specificity for certain critical parameters which necessitated educated guesses."[147] In its reply, supported by the National Broadcast Association (NAB), MSTV argues that its request is to limit BPL operations to below 50 MHz on a temporary basis until the end of the DTV transition only.[148]

69. Decision. In the *Report and Order*, the Commission noted that in many instances all low band Very High Frequency (VHF) television channels are not used within a particular area and those channels that are not in use for television service could be used for Access BPL operations without causing harmful interference to television reception.[149] The Commission further noted that the effective Part 15 emission limit for Access BPL systems is more stringent for frequencies above 30 MHz than it is for frequencies below 30 MHz and that propagation losses are also more significant at higher frequencies. The Commission therefore concluded that special protections for broadcast television service are not warranted. We find that MSTV's *BPL-Television Study* does not take into account the instances where the VHF TV channels might not all be used within a particular area and only focuses on the worst case scenarios. While Current Technologies correctly points out some flaws in the initial analysis by MSTV, we recognize that there is a potential for BPL interference to DTV reception if a BPL system operates adjacent to or within the spectrum of a locally-used VHF TV station. BPL providers should therefore be cautious in selection of frequency bands in order to avoid such interference. We continue to believe however that the adopted Access BPL rules will protect all licensed services, including television services. We therefore decline to change the BPL rules to require that Access BPL systems use only frequencies below 50 MHz, even temporarily. Accordingly, we deny MSTV's request for this change to the rules.

70. *Critical infrastructure industry (CII).* The rules require Access BPL operators to notify and consult with the public safety agencies in their local areas, *i.e.*, state and local police, fire, emergency medical, etc., and other entities that are eligible for public safety licenses under Section 90.20 of the rules, at least 30 days in advance of initiation of service.[150] The rules also require Access BPL operators to respond to complaints of harmful interference from public safety users within 24 hours.[151] The

[144] Petition of MSTV at 5-6 and 10.

[145] *Id.* at 8 and 10-11; *see also, Interference Effects into Low VHF Television arising from Broadband over Power Line (BPL-Television Study)* filed as an Appendix to MSTV's petition.

[146] Opposition of Current, in Technical Appendix.

[147] Opposition of UPLC at 4 and petition of MSTV at 26.

[148] Reply of MSTV at 6, and NAB at 1.

[149] *Report and Order* at ¶24. The Very High Frequency (VHF) band covers frequencies from 30 to 300 MHz.

[150] *See* 47.C.F.R. § 90.20; *see also,* 47 C.F.R. §15.615(d).

[151] 47 C.F.R. §15.615(e).

Commission adopted these requirements to specifically protect public safety systems because of the critical and safety-of-life nature of their services. The rules do not, however, make any such distinction for protection of CII entities.

71. Petition and Responses. The American Petroleum Institute (API) requests that we modify the BPL rules to treat CII entities (including petroleum and natural gas companies) as public safety entities so that they would be entitled to the 30-day advance consultation and the 24-hour interference complaint response time requirements.[152] API argues that the Commission's definition of CII adopted in the *800 MHz Order* includes these private radio systems because they are employed in protecting lives, health and property, as well as during response to oil spills and other emergency incidents.[153] It requests that parties designated as CII entities for purposes of the *800 MHz Order* should also be treated the same as public safety entities for purposes of the BPL rules.

72. Current and Ameren oppose the API's request, arguing that advance notice of deployment would add no meaningful protection to CII licensees identified in the *800 MHz Order* but would impose additional and unwarranted administrative burdens on the nascent BPL industry.[154] These parties state that electric utilities fully recognize the importance of protecting CII operations as they are in effect CII facilities themselves, and BPL transmissions, which carry both emergency communications by consumers and utility company management of critical infrastructure, are communications important to the public welfare. They contend, however, that consultation with the large numbers of CII entities and the lack of a realistic threat of harmful interference from compliant BPL equipment would cause undue burden to the nascent BPL industry and threaten BPL deployments.[155] API replies that it would be unlikely for more than a handful of CII entities to request advance notification within the operating area of any particular BPL provider and that the advance notification could consist of a single email message to all, so that the process would not be unduly burdensome.[156]

73. Decision. We note that in the *800 MHz Order*, the Commission adopted the definition in 47 U.S.C. § 337(f) for CII as those entities, outside of the "public safety service", which operate "public safety" radio services within the scope of Section 309(j)(2) of the Act.[157] However, the Commission specifically stated that the adopted definition of CII was confined to matters addressed in the 800 MHz proceeding and did not represent a Commission decision that all CII entities are public safety entities.[158] Furthermore, in the *Supplemental Order and Order on Reconsideration (Supplemental Order)* in the same proceeding, the Commission afforded additional protection to public safety radio services, but specifically excluded CII licensees from that additional protection.[159] Therefore, the Commission did not give

[152] *See* Petition of API at 4. API's members consist of a number of petroleum and natural gas companies that use private land mobile radio services operating in the 25-50 MHz band for oil spill containment and cleanup and related drills and training.

[153] *Id.*, at 2-3; *see also, In the matter of Improving Public Safety Communications in the 800 MHz band, Report and Order, Fifth Report and Order, Fourth Memorandum of Opinion and Order (800 MHz Order)*, WT Docket No. 02-55, 19 FCC Rcd 14969 (2004) at ¶4 and footnote 11.

[154] Opposition of Current at 17 and Ameren at 2.

[155] *See* Opposition of Current at 17-18 and Ameren at 5.

[156] Reply of API at 3.

[157] 47 U.S.C. § 309(j)(2) defines CII as "public safety radio services" including private internal radio services used by State and local governments and non-government entities, and including emergency road services provided by not-for profit organizations, that: (i) are used to protect the safety of life, health, or property; and (ii) are not made commercially available to the public.

[158] *800 MHz Order*, at footnote 11.

absolute public safety status to CII licensees in the 800 MHz proceeding, as argued by API.

74. In addition, in the instant proceeding, we have decided to restrict the list of entities whose functions would be afforded additional protection against possible interference from Access BPL operations to those who provide national defense, maritime distress and safety, aeronautical navigation and communications, emergency response, radio astronomy, and others that provide important safety and research services.[160] We determined that for all other radio communication operations not addressed in those special provisions — which would include petroleum and natural gas entity members of API — radio operators always have the opportunity to inform local BPL operators of the pertinent details of their operations and BPL operators have the opportunity to apply that information as appropriate to prevent interference.[161] These measures will sufficiently protect these radio services. We note that most of petroleum and gas facilities are in fixed locations, thus potential interference can be readily anticipated and avoided, and readily resolved where it does occur. API has not demonstrated that there is likelihood of an initial occurrence of harmful interference concurring with an emergency communication of some kind from that site. We therefore are not persuaded by API's arguments that entities operating petroleum and natural gas industries are public safety entities that should be afforded special protection against potential interference from Access BPL. Accordingly, we deny API's petition in this regard.

75. *Miscellaneous requests for additional operational restrictions on BPL.* McVey requests that we require BPL operators to install deactivation switches in all public safety dispatch offices so that dispatchers can stop Access BPL system operation in an emergency.[162] He further requests that we require Access BPL operators be able to be reached on a 24-hour, 7-day basis, not just a 24-hour response time.[163] McVey also requests that Access BPL operators be required to compensate public safety licensees for any costs associated with BPL interference control and mitigation, because many public safety entities are volunteer organizations that lack the funding and expertise to determine interference incidents.[164] Whedbee asks that we impose annual regulatory fees on BPL systems in order to offset the costs caused by these systems to the government and to licensed radio services.[165] Similarly, Richmond repeats his previous requests that BPL operators be required to compensate spectrum users who receive harmful interference.[166] NAC/Amherst and Matda request that the BPL rules be held in abeyance and argue that there is already a rapid expansion of broadband services without this technology, so that the Commission's action in adopting BPL rules is unnecessary.[167] Matda further argues that the adopted rules are deficient, as the Commission ignores the threat of interference from BPL into cable and phone lines.[168] CDE requests that we include the public as a partner in the rules for interference mitigation adopted in the *Report and Order.*[169]

(...continued from previous page)

[159] *See In the matter of Improving Public Safety Communications in the 800 MHz band, Supplemental Order and Order on Reconsideration,* WT Docket No. 02-55, 19 FCC Rcd 25120 (2004).

[160] *See Report and Order* at ¶49.

[161] *Id.*

[162] Petition of McVey at 6.

[163] *Id.*, at 7.

[164] *Id.* at 7-8.

[165] *See* petition of Whedbee (page unnumbered).

[166] Richmond at Sec. II.

[167] NAC/Amherst at 5-6 and Matda (pages unnumbered).

[168] Matda (pages unnumbered).

[169] Petition of CDE at 4.

76. Current argues that these requests lack justification and seem calculated primarily to impede the deployment of BPL.[170] It states that contrary to the beliefs of McVey, NAC/Amherst and Matda, wireless prices remain high and service options remain low when only two providers are present in a market. It argues that such an environment does not generate adequate competition.[171] Current also states that because BPL operations were already permitted under the pre-existing Part 15 rules, its appearance in the market was inevitable and that the Commission did not authorize BPL in this rulemaking, but only adopted rules to minimize adverse effects on licensed users.[172]

77. Decision. We believe that the complex arrangement of having deactivation switches for BPL systems within each public safety dispatch center would prove unduly disruptive to BPL operations, especially given the numerous potential sources that one could mistake for BPL interference. In addition, if the BPL operator has complied with the consultation requirements regarding locally used public safety frequencies, the risk of interference to local public safety communications is already minimized.[173] Furthermore, the costs and burden of consultation and interference avoidance measures are entirely borne by the BPL operator who must re-configure his system to comply with the rules, and not by the public safety entity, which does not need to have special expertise to provide a list of its locally used frequencies. We also find that McVey simply repeated his argument for requiring a 24-hour response time, which we have discussed and fully disposed of in the *Report and Order*.[174] Accordingly, we find no merit in McVey's proposals and we deny McVey's petition.

78. We also observe that Section 9 of the Communications Act, which sets out the schedule of communications regulatory fees, does not include any provision for fees on unlicensed Part 15 devices, such as BPL, and we dismiss the petitions from Whedbee and Richmond.[175]

79. In addition, we agree with Current that BPL will introduce additional competition into the broadband market and that even markets that now offer both DSL and cable modem services will benefit from the competition provided by BPL.[176] We note that NAC/Amherst did not present any new information that would persuade us to reconsider our decision and that it merely repeats the same arguments previously submitted in the record, that have been fully considered.[177] Accordingly, we also dismiss the petition of NAC/Amherst. We note that the Commission did consider the issue of interference to cable and phone lines in the *Report and Order* and Matda did not provide any new information.[178] Accordingly, we dismiss the petition of Matda. Finally, we observe that the public is already an intrinsic party to any BPL interference issue as the new Access BPL database is a publicly-accessible database, which would contain information on BPL installations searchable by any member of the public. Accordingly, we deny CDE's petition.

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[170] Opposition of Current at 20.

[171] *Id.* at 22.

[172] *Id.* at 23.

[173] 47 C.F.R. §15.615(e).

[174] *Report and Order* at ¶86. The Commission decided that, except for public safety, telephone contact staffing during normal business hours is sufficient for the purposes of addressing interference inquiries and noted that email would generally allow interference reports to be filed at any time.

[175] *See* 47 U.S.C §159(b)(3) & (g).

[176] Opposition of Current at 22.

[177] *See Report and Order* at ¶¶58 & 83.

[178] *Report and Order* at ¶17.

IV. PROCEDURAL MATTERS

80. *Final Regulatory Flexibility Certification.* The Regulatory Flexibility Act of 1980, as amended (RFA),[179] requires that a regulatory flexibility analysis be prepared for rulemaking proceedings, unless the agency certifies that "the rule will not have a significant economic impact on a substantial number of small entities."[180] The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."[181] In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.[182] A "small business concern" is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration (SBA).[183]

81. The *Report and Order* modified the Part 15 rules to allow for Access Broadband over Power Line (Access BPL) systems, a new type of carrier current system that operates on an unlicensed basis under Part 15. A Final Regulatory Flexibility Analysis was incorporated in the *Report and Order.*[184] Following publication of the *Report and Order*, fifteen parties filed for reconsideration regarding various aspects of the Part 15 BPL regulations. A list of the petitioners, along with the abbreviations used to identify them and the parties that filed comments in response to the petitions, is attached as Appendix A. In this *Memorandum Opinion and Order,* we are amending the rules to replace the exclusion zone requirement for the ten listed radio astronomy facilities with an exclusion zone for one Very Large Array (VLA) radio astronomy observatory site at 73.0-74.6 MHz, which would significantly reduce potential deployment constraints on Access BPL installations. In addition, we are amending the rules to add prospective protection for relocated aeronautical facilities, which merely continues to provide protection to these stations. Finally, we correct the coordinates and email contacts for the aeronautical facilities subject to BPL consultation.

82. We find that these changes will not result in a "significant economic burden" on manufacturers. Therefore, we certify that the amendments included in this *Memorandum Opinion and Order* will not have a significant economic impact on a substantial number of small entities.

83. The Commission will send a copy of the *Memorandum Opinion and Order*, including a copy of this final certification, in a report to Congress pursuant to the Small Business Regulatory Enforcement Fairness Act of 1996.[185] In addition, the *Memorandum Opinion and Order* and this certification will be sent to the Chief Counsel for Advocacy of the Small Business Administration, and will be published in

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[179] The *RFA*, *see* 5 U.S.C §§ 601 *et seq.*-612, has been amended by the Contract With America Advancement Act of 1996, Pub. L. No. 104-121, 110 Stat. 847 (1966) (CWAAA). Title II of the CWAAA is the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA).

[180] 5 U.S.C. § 605(b).

[181] 5 U.S.C. § 601(6).

[182] 5 U.S.C. § 601(3) (incorporating by reference the definition of "small-business concern" in the Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term which are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register."

[183] 15 U.S.C. § 632.

[184] *See Report and Order* in ET Docket No. 04-37, 19 FCC Rcd 21265, 21322 (2004).

[185] *See* 5 U.S.C. § 801(a)(1)(A).

the Federal Register.[186]

V. ORDERING CLAUSES

84. Accordingly, IT IS ORDERED that pursuant to the authority contained in Sections 4(i), 301, 302, 303(e), 303(f) and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. Sections 154(i), 301, 302, 303(e), 303(f) and 303(r), this Memorandum Opinion and Order IS ADOPTED and Part 15 of the Commission's Rules ARE AMENDED as set forth in the attached appendix effective 30 days after publication in the Federal Register.

85. IT IS FURTHER ORDERED that pursuant to the authority contained in Sections 4(i), 301, 302, 303(e), 303(f) and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. Sections 154(i), 301, 302, 303(e), 303(f) and 303(r), the request for partial reconsideration filed by the National Telecommunications and Information Administration on February 14, 2005 IS GRANTED to the extent indicated herein. IT IS FURTHER ORDERED that pursuant to the authority contained in Sections 4(i), 301, 302, 303(e), 303(f) and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. Sections 154(i), 301, 302, 303(e), 303(f) and 303(r), the motion for partial reconsideration filed by Current Technologies, LLC, Amperion, Inc., the United Power Line Council, and Aeronautical Radio, Inc. on February 7, 2005 IS GRANTED IN PART AND DENIED IN PART to the extent indicated herein.

86. IT IS FURTHER ORDERED that pursuant to the authority contained in Sections 4(i), 301, 302, 303(e), 303(f) and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. Sections 154(i), 301, 302, 303(e), 303(f) and 303(r), the motion for reconsideration filed by the American Petroleum Institute, the Amateur Radio Relay League, the Association for Maximum Services Television, Inc., and Cohen, Dippell and Everist, P.C. filed on February 7, 2005, W. Lee McVey filed on January 18, 2005, the National Antenna Consortium and the Amherst Alliance filed on January 18, 2005, Steven E. Matda filed on January 19, 2005, G. Scott Davis filed on January 21, 2005, Cortland E. Richmond filed on December 14, 2004, and James Edwin Whedbee filed on October 18, 2004, IS DENIED to the extent indicated herein.

87. IT IS FURTHER ORDERED that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, SHALL SEND a copy of this Memorandum Opinion and Order, including the Final Regulatory Flexibility Certification, to the Chief Counsel for Advocacy of the Small Business Administration.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch

Marlene H. Dortch
Secretary

[186] *See* 5 U.S.C. § 605(b).

APPENDIX A

Parties Filing Petitions for Reconsideration of the Report and Order

1. Aeronautical Radio, Inc. (ARINC)
2. American Petroleum Institute (API)
3. American Radio Relay League, the National Association for Amateur Radio (ARRL)
4. Amperion, Inc. (Amperion)
5. Association for Maximum Service Television, Inc. (MSTV)
6. Cohen, Dippell and Everist, P.C. (CDE)
7. Current Technologies, LLC (Current)
8. Davis, G. Scott (Davis)
9. Matda, Steven E. (Matda)
10. McVey, W. Lee (McVey)
11. National Antenna Consortium and the Amherst Alliance (NAC/Amherst)
12. National Telecommunications Information Administration (NTIA) (letter)
13. Richmond, Cortland E.
14. United Power Line Council (UPLC)
15. Whedbee, James E.

Comments and Reply Comments Filed in Response or Opposition to the Petitions for Reconsideration

1. Academy of Model Aeronautics (AMA)
2. ACcess Broadband, LLC (ACcess)
3. Aeronautical Radio, Inc. (ARINC)
4. Ambient Corporation (Ambient)
5. Ameren Energy Communications, Inc., Virginia Electric and Power Company, and Tucson Electric Power Company (collectively, Ameren)
6. American Petroleum Institute (API)
7. American Radio Relay League, the National Association for Amateur Radio (ARRL)
8. Current Technologies, LLC (Current)
9. Davis, G. Scott (Davis)
10. HomePlug Powerline Alliance (HomePlug)
11. Intellon Corporation (Intellon)
12. Matda, Steven E. (Matda)
13. McVey, W. Lee (McVey)
14. National Association of Broadcasters (NAB)
15. Phonex Broadband Corporation (Phonex)
16. SPiDCOM Technologies S.A. (SPiDCOM)
17. United Power Line Council (UPLC)
18. Whedbee, James E. (Whedbee)

APPENDIX B

FINAL RULE CHANGES

Title 47 of the Code of Federal Regulations, Part 15, is amended as follows:

1. The authority citation for Part 15 continues to read as follows:

AUTHORITY: **47 U.S.C.154, 302, 303, 304, 307 and 544A.**

2. Section 15.611 is amended by adding paragraph (c)(1)(iii) to read as follows:

Section 15.611 General technical requirements.

* * * * *

(c) * * *
(1) * * *
(i) * * *
(ii) * * *
(iii) At locations where an Access BPL operator attenuates radiated emissions from its operations in accordance with the above required capabilities, we will not require that operator to take further actions to resolve complaints of harmful interference to mobile operations.

* * * * *

3. Section 15.615 is amended by revising paragraphs (f)(2),(f)(3) and Table 3b and deleting paragraph (f)(2)(iii) to read as follows:

Section 15.615 General administrative requirements.

(f) * * *
(1) * * *
(2) *Exclusion zones.* Exclusion zones encompass the operation of any Access BPL system within 1km of the boundary of coast station facilities at the coordinates listed in Tables 2 and 2.1. Exclusion zones also encompass the operation of Access BPL systems using overhead medium voltage power lines within 65 km of the Very Large Array observatory located at the coordinate 34°04' 43.50" N, 107° 37' 03.82" W. Exclusion zones further encompass the operation of Access BPL systems using overhead low voltage power lines or underground power lines within 47 km of the Very Large Array observatory located at the coordinate 34°04' 43.50" N, 107° 37' 03.82" W. Within the exclusion zones for coast stations, Access BPL systems shall not use carrier frequencies within the band of 2173.5-2190.5 kHz. Within the exclusion zone for the Very Large Array radio astronomy observatory, Access BPL systems shall not use carrier frequencies within the 73.0-74.6 MHz band.
(i) * * *
(ii) * * *
(3) *Consultation areas.* Access BPL operators shall provide notification to the appropriate point of contact specified below regarding Access BPL operations at any frequencies of potential concern in the following consultation areas, at least 30 days prior to initiation of any operation or service. The notification shall include, at a minimum, the information in paragraph (a) of this section. We expect parties to consult in good faith to ensure that no harmful interference is caused to licensed operations and that any constraints on BPL deployments are minimized to those necessary to avoid harmful interference.

In the unlikely event that a new or relocated aeronautical receive station is established for the 1.7-30 MHz band at a coordinate not specified in Table 3b, Access BPL operators are also required to coordinate with the appropriate point of contact regarding Access BPL operations at any frequencies of potential concern in the new or relocated consultation areas, and to adjust their system operating parameters to protect the new or relocated aeronautical receive station.

* * * * *

(*ii*) For frequencies in the 1.7–80.0 MHz frequency range, the areas within 4 km of facilities located at the coordinates specified for radio astronomy facilities in 47 C.F.R. § 2.106, Note US 311.

Point of Contact
Electromagnetic Spectrum Manager
National Science Foundation
Division of Astronomical Sciences
4201 Wilson Blvd. Suite 1045
Arlington, VA 22230
(703) 292-4896
esm@nsf.gov

* * * * *

Table 3b. Consultation Area Coordinates for Aeronautical Receive Stations (1.7 – 30 MHz)

Point of contact
ARINC
2551 Riva Road
Annapolis, MD 21401
Tel: 1-800-633-6882
Fax: 410-266-2329
Email: bplnotifications@arinc.com
www.arinc.com

Locale	Latitude	Longitude
Southampton, NY	40° 55' 15"N	72° 23' 41" W
Molokai, HI	21° 12' 23" N	157° 12' 30" W
Oahu, HI	21° 22' 27" N	158° 05' 56" W
Half Moon Bay, CA	37° 39' 64" N	122° 24' 44" W
Pt. Reyes, CA	38° 06' 00" N	122° 56' 00" W
Barrow, AK	71° 17' 24" N	156° 40' 12" W
Guam	13° 28' 12" N	144° 48' 0.0" E (note: Eastern Hemisphere)
NY Comm Center, NY	40° 46' 48" N	73° 05' 46" W
Cedar Rapids, IA	42° 02' 05.0" N	91° 38' 37.6" W
Beaumont, CA	33° 54' 27.1" N	116° 59' 49.1" W
Fairfield, TX	31° 47' 02.6" N	96° 47' 03.0" W
Houston, TX	29° 36' 35.8" N	95° 16' 54.8" W
Miami, FL	25° 49' 05" N	80° 18' 28" W

Note: Systems of coordinates conform to NAD 83

* * * * *

STATEMENT OF CHAIRMAN KEVIN J. MARTIN

Re: Amendment of Part 15 regarding new requirements and measurement guidelines for Access Broadband over Power Line Systems; Carrier Current Systems, including Broadband over Power Line Systems, *Memorandum Opinion and Order*

In this item, we build upon our previous efforts to facilitate deployment of broadband over power line (BPL) systems while protecting existing spectrum users from harmful interference. It is my hope that our rules will allow BPL systems to flourish. This technology holds great promise as a ubiquitous broadband solution that would offer a viable alternative to cable, digital subscriber line, fiber, and wireless broadband solutions. Moreover, BPL has unique advantages for home networking because consumers can simply plug a device into their existing electrical outlets to achieve broadband connectivity. Promoting the deployment of broadband continues to be one of our top priorities and today's action is another step towards reaching that goal.

STATEMENT OF COMMISSIONER MICHAEL J. COPPS

Re: Amendment of Part 15 Regarding New Requirements and Measurement Guidelines for Access Broadband over Power Line; Carrier Current Systems Including Broadband over Power Line Systems, *Memorandum Opinion and Order*

We all have high hopes for Broadband over Power Line and I think we would all like to see some non-duopoly pipes bringing broadband access to, particularly, hard-to-reach Americans. We are behind the game in putting high-speed, high value bandwidth to work for all our citizens. You know something is wrong when the best case scenario is that a consumer has a choice between two broadband connections, both of which are more expensive and considerably slower than what consumers in other industrialized nations enjoy. And that's how it works in our wealthy metropolitan areas. Over much of the rest of America, it just gets worse. Customers in rural, and even some urban, areas often cannot get a broadband connection at all. Or their only option is so expensive as to be unattainable as a practical matter.

If you want a quantitative sense of how bad things have gotten, consider this: Last year, the International Telecommunications Union (ITU) listed us at 16th in the world in broadband penetration. Using the ITU's newer and more sophisticated Digital Opportunity Index, your country and mine is now ranked 21st in the world.

The reason we're so far behind, of course, is that – in the words of the Congressional Research Service – our residential broadband market is a flat out "cable and telephone duopoly." Indeed, this market has an HHI index of roughly 5,500 to 5,800 – well over *three times* what the Department of Justice considers "highly concentrated." And this is not just some run of the mill product like a toaster or a lawnmower – it is the data pipe over which all future communications will run.

I recount these alarming statistics just to emphasize how important it is for this Commission to take every step within our power to encourage new broadband competitors. And that brings us to this item. Along with wireless technologies, Broadband over Power Line is a credible candidate for a "third pipe" that could bring meaningful competition to this market. Accordingly, I am pleased that we take steps today to resolve certain questions about BPL and radio interference. The BPL industry needs regulatory certainty from us, and I believe today's item helps provide some certainty—although important policy questions remain to be tackled and need to be tackled.

Even as we seek to encourage BPL – as I stated when we issued our initial order two years ago – we must also ensure that its providers protect existing spectrum users from interference. This applies with special force to amateur radio operators whose skills and dedication once again proved so valuable in the aftermath of Hurricane Katrina. Amateur radio serves the public interest in so many ways that we must be always mindful of its needs. I believe today's Order strikes an acceptable balance between protecting existing users and providing BPL an environment conducive to innovation and to getting on with the job of deployment. But we should be ever alive to the reality that the unexpected often happens and unforeseen consequences are as often the rule as they are the exception. That's why the Commission must be available and positioned to respond to interference complaints with alacrity. Amateur operators shouldn't have to wait for months to get complaints resolved—they deserve better.

So I want to thank the Chairman and my fellow Commissioners for including language in today's item reaffirming the Commission's commitment to providing amateur radio users with assurances of expeditious relief when they are subject to impermissible interference. When we ask multiple users to share the same spectrum, that old line about justice delayed being justice denied is especially apt. For that reason, this Commission must monitor, investigate, and act quickly to make sure that the rules we reaffirm today are being observed out in the field. If for any reason these procedures prove inadequate, I, for one, will be back asking for more.

Thanks to the Bureau for working through these difficult issues and for bringing this item to us today. I am pleased to support it.

STATEMENT OF COMMISSIONER DEBORAH TAYLOR TATE

Re: Amendment of Part 15 Regarding New Requirements and Measurement Guidelines for Access Broadband over Power Line Systems, Carrier Current Systems including Broadband over Power Line Systems, *Memorandum Opinion and Order*

About three years ago, I first had the opportunity to hear about the potential for a new technology – called Broadband-over-Power-Lines (BPL) – being tested in a small rural area in Tennessee. Over the past few months, I have witnessed BPL in action in Texas and Maryland. Each time, I am struck by the impact this technology could have on reaching our goal of ubiquitous broadband deployment in the United States. It's an exciting prospect, and I am pleased to support this *Memorandum Opinion and Order* today in support of this technology.

In 2005, 24% of rural Americans had broadband access at home, more than double the 9% reported in 2003, according to the Pew Internet and American Life Project. BPL technology could increase that number in no time at all if and when it is able to be deployed on a nationwide basis. When you consider the effect this could have on Americans in terms of everything from entertainment to education to health to job productivity and just about every other aspect of American life, you truly begin to realize how important BPL might be. I hope that the FCC can continue to be a part of the effort to make this technology available to more and more Americans.

BPL is another regulatory question requiring us to balance regulatory humility with our oversight responsibilities. The FCC has and will continue to struggle with finding an appropriate balance between regulation to mitigate potential negative "side effects" that accompany BPL and a hands off approach that gives BPL the room it needs to develop in a free market. I believe that today's *Opinion and Order* strikes the right balance with minimal regulatory burdens. I also hope we will continue to be cognizant of the impact our regulations have on the industry, and I welcome a continuing dialogue regarding some of the potential concerns noted in the record.

STATEMENT OF COMMISSIONER ROBERT M. McDOWELL

RE: Amendment of Part 15 Regarding New Requirements and Measurement Guidelines for Access Broadband Power Line Systems, Carrier Current Systems, Including Broadband over Power Line Systems, *Memorandum Opinion and Order*

I am delighted that today the Commission is taking additional steps to help bring new competition to the broadband marketplace. I am hopeful that, as an additional delivery platform, BPL will help drive down consumer prices and foster innovative technologies. I am also optimistic that BPL will improve the ability of power companies to manage electric power grids, which is especially important given recent strains on our nation's power system.

I am pleased to support today's item, and I thank the Chairman and the OET staff for tackling this challenging balancing act. Although the Commission's rules provide a minimal regulatory framework, which is appropriate for a nascent service like BPL, we have been mindful of our obligation to protect existing licensees from harmful interference from BPL systems as well. We acknowledge amateur radio operators' concerns in this regard, and I am confident that the Commission will remain responsive to this community as we move forward.