



28 November 2005

R.W. McCaughern
Director General
Spectrum Engineering Branch
Industry Canada
300 Slater Street,
Ottawa, Ontario,
K1A 0C8

Don Woodford
Director -
Government &
Regulatory Affairs

Dear Mr. McCaughern:

Subject: Bell Wireless Alliance Comments in Response to the Consultation Paper on Broadband over Power Line (BPL) Communication Systems, Canada Gazette - Part 1, Notice No. SMSE-005-05, dated 30 July 2005

1. Bell Mobility, on behalf of the Bell Wireless Alliance (BWA), is pleased to submit the attached comments in response to the above captioned consultation.
2. If there are any questions concerning these comments, please do not hesitate to contact the undersigned.

Yours truly,

Attachment

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Canada Gazette Notice No. SMSE-005-05

Consultation Paper on Broadband over Power Line (BPL)
Communication Systems

Published in the *Canada Gazette*, Part 1
dated 30 July 2005

Bell Wireless Alliance
Comments
on behalf of

Aliant Telecom Inc.
Bell Mobility Inc.
NMI Mobility Inc.
NorthernTel Mobility
Saskatchewan Telecommunications
and
Télébec Mobility

28 November 2005

INTRODUCTION

1. Bell Mobility, on behalf of the Bell Wireless Alliance (BWA), is pleased to provide the following comments in response to Notice No. SMSE-005-05: *Consultation Paper on Broadband over Power Line (BPL) Communication Systems*, as published in the *Canada Gazette*, Part I dated 30 July 2005 (the Consultation). For the purpose of this submission the members of the BWA include Aliant Telecom Inc., Bell Mobility Inc., NMI Mobility Inc., NorthernTel Mobility, Saskatchewan Telecommunications and Télébec Mobility.

2. Industry Canada (Industry Canada or the Department) states that it is releasing the consultation paper to seek public and industry views on systems that deliver high-speed Internet and broadband services over power lines. These systems are often referred to as Broadband Power Line (BPL) communication systems. More specifically, the Department states that the intent of this consultation paper is to seek comment on the deployment and regulation of BPL systems in general, including the specific equipment standards and operational requirements that would be required if BPL systems were deployed. Moreover, the Department intends to take steps to facilitate the deployment of BPL technology in Canada while ensuring the protection of authorized radiocommunication services.

3. The BWA is pleased to provide the following comments in response to proposals and questions raised in the above-mentioned consultation paper, and looks forward to working with the Department as future consultations related to this matter are issued.

3.2 General Descriptions of BPL Systems

3.2.1 Access BPL

4. At this time, the Department is proposing to adopt the following definition for Access BPL systems:

Access Broadband over Power Line (Access BPL): *A carrier current system installed and operated on an electric utility service as an unintentional radiator that sends radio frequency energy on frequencies between 1.705 MHz and 80 MHz over medium-voltage lines or over low-voltage lines to provide broadband communications and is located on the supply side of the utility service's points of interconnection with customer premises.*

The Department seeks comment on the above definition and its suitability for describing Access BPL.

5. The BWA notes that the proposed definition is the same as the definition of Access BPL in the FCC's BPL rules. The BWA concurs with this definition. However, similar to the FCC's clarification in its definition for Access BPL, i.e., that it does not include power line carrier systems and In-house BPL systems, the BWA recommends the inclusion of a similar statement clarifying that Access BPL does not include power line carrier systems as currently defined in RSS-Gen (Section 8), and In-house BPL which is expected to be defined in ICES-006.

6. Further, the BWA recommends that the definition of power line carrier system in RSS-Gen would need to be updated to clarify that it is an unintentional radiator and operated within the band 9-490 kHz. In addition, the provision of rules for the operation of power line carrier systems, similar to the FCC rules would need to be investigated.

3.3 In-house BPL

7. At this time, the Department is proposing to adopt the following definition for In-house BPL systems:

***In-house broadband over power line (In-house BPL):** A carrier current system, operating as an unintentional radiator, which sends radio frequency energy by conduction over electric power lines that are not owned, operated or controlled by an electric service provider. The electric power lines may be aerial (overhead), underground, or inside the walls, floors or ceilings of user premises. In-house BPL devices may establish closed networks within a user's premises or provide connections to Access BPL networks, or both.*

The Department seeks comment on the above definition and its suitability for describing In-house BPL.

8. It would be desirable to provide the definition of In-house BPL in the ICES-006 document.

4.2 Deployment Issues

9. Besides the potential interference to various authorized radio services in the 2-80 MHz frequency range as stated, the deployment of Access BPL systems has the potential to create significant interference problems with telecommunications services specifically under the two situations as described below.

10. First, a telecommunication cable or drop wire could potentially parallel a power line for hundreds of feet. The distance between the drop wire and power line carrying Access BPL could be much less than the 10 meters at which the radiated emissions are to be measured. Since the drop wire is not shielded, Access BPL systems could potentially interfere with the existing DSL services, and the future "Very High Bit Rate Digital Subscriber Line (VDSL)" services with transmissions in the 25 kHz-12 MHz spectrum range.

11. Second, metallic sheaths of telecommunication cables often carry some of the power line "return current" which, at times, could be over one ampere. The "return" current on the sheath would result in a significant amount of common-mode current flowing in each of the cable pairs. This does not cause a problem at 60 Hz, but the harmonics of 60 Hz could cause a problem and interfere with voiceband services. Similarly interference could arise from Access BPL "current" flowing in the cable sheaths to the DSL and VDSL services.

6.0 Discussion and Proposals

The following sections invite comment on specific standards and requirements for Access BPL systems. The Department also seeks comment on any other specific issue or concern relating to the Department's role in the deployment and regulation of BPL systems in general.

12. The BWA's comments are as follows.

6.1 Equipment Standard and Approval Process

13. The BWA supports the Department's proposal for the use of a certification process for Access BPL equipment together with the Department's authorization of each specific BPL system. Further, the BWA refers the Department to the response of the RABC with respect to this question with which it concurs.

6.2 Prospective Technical Requirements

a) Emission Limits

Access BPL systems operating below 30 MHz will be subject to following limits:

Frequency (MHz)	Field strength (microvolts/metre)	Measurement Distance (metres)
1.705-30.0	30	30

Access BPL systems operating above 30 MHz will be subject to the following limits:

Frequency (MHz)	Field strength (microvolts/metre)	Measurement Distance (metres)
30-80	90	10

The Department seeks comment on the above limits and their suitability for Access BPL systems in Canada.

Please provide technical rationale.

14. The BWA notes that the Department had issued a note dated 7 October 2005 revising their proposed emission limits, which was posted on it's web page for the BPL consultation paper. In particular, the measurement distance for Access BPL systems above 30 MHz was corrected from 3 meters to 10 meters aligning with the FCC's emission limits.

15. The BWA supports the Department's proposal to harmonize with the FCC's emission limits. The BWA notes that the FCC has stated emission limits for Access BPL systems operating over medium voltage (MV) power lines and separate emission limits for Access BPL systems operating over low voltage (LV) power lines. However, it is not clear from the Department's proposal whether the emission limits stated above are applicable for operation over MV or LV power lines. Consequently, the BWA recommends that the proposed emission limits should be harmonized with the FCC's emission limits, and therefore, restated as follows:

i) Access BPL systems operating over Medium Voltage (MV) Power Lines

16. It is understood that the Department had intended these emission limits as stated above, and in the consultation paper for Access BPL systems operating over MV power lines only.

ii) **Access BPL systems operating over Low Voltage (LV) Power Lines**

(a) *Access BPL systems operating below 30 MHz will be subject to the following limits:*

Frequency (MHz)	Field strength (microvolts/metre)	Measurement Distance (metres)
1.705-30.0	30	30

(b) *Access BPL systems operating above 30 MHz will be subject to the following limits:*

Frequency (MHz)	Field strength (microvolts/metre)	Measurement Distance (metres)
30-80	100	3

b) **Interference Mitigation Requirements for Access BPL Systems**

In addition to establishing appropriate emission limits, the Department is proposing that Access BPL equipment/systems incorporate adaptive interference mitigation techniques to minimize the potential for interference to radiocommunication users. These include:

- *remote controllable shut-down features;*
- *remote power reduction; and*
- *notch filtering and/or frequency avoidance.*

The Department seeks comment on whether:

- 1) Access BPL equipment should incorporate adaptive interference mitigation techniques as described above; and,***
- 2) Additional or alternative interference mitigation techniques, if any, should be used to minimize the potential for interference to authorized services.***

Please provide rationale.

17. The BWA supports the Department's proposed adaptive interference mitigation techniques, as listed above, in order to minimize the potential for interference not only to radiocommunication users but also to non-radiocommunication users, such as the telephone companies' networks providing DSL and VDSL services.

18. As suggested by the U.S. National Telecommunications and Information Administration (NTIA), the use of adaptive or command power control could significantly reduce the risk of interference by maintaining Access BPL signals near the minimum power level as needed for service. In addition, blocking filters should be used to limit the reach of their transmissions beyond where service is provided.

The Department has proposed a number of technical requirements to address the use of Access BPL equipment and to minimize the potential for interference to authorized services from deployed Access BPL systems.

The Department seeks comment on any additional technical requirements for Access BPL systems.

Please provide supporting technical rationale.

19. In accordance with the FCC rules, BPL systems must incorporate capabilities to modify their operations to "notch out" any specific frequency. Minimum depth of frequency notches: 20 dB below 30 MHz and 10 dB above 30 MHz, as in the FCC rules.

6.3 Operational Requirements

a) Prohibited Frequency Bands

The Department is proposing to prohibit Access BPL systems from operating in specific frequency bands including bands used for aeronautical services, public safety and national defence. The Department believes that this approach is necessary to ensure the protection of safety-related services.

The Department seeks comment on:

- 1) The suitability of the above approach to protect safety-related services;***
- 2) What other approaches, if any, should be taken to protect safety-related radiocommunications; and***
- 3) What bands, if any, should be excluded from use by Access BPL systems.***

Please provide rationale.

20. The BWA supports the Department's proposal to prohibit Access BPL systems from operating in specific frequency bands used for aeronautical services, public safety and national defence. Further, the BWA refers the Department to the response of the RABC with respect to this question with which it concurs.

b) Geographical Frequency Restrictions and Coordination Requirements

The Department believes that there could be specific geographic areas where Access BPL systems should not be deployed and that coordination with specific authorized users may be necessary.

The Department seeks comment on:

- 1) What specific geographic locations, if any, should Access BPL systems be prohibited from operating?**
- 2) As opposed to total ban, should Access BPL systems be able to operate in these locations if specific frequencies were avoided?**
- 3) What procedure, if any, should be used to facilitate coordination between BPL operators and specific authorized users?**

Please provide rationale.

21. The BWA refers the Department to the response of the RABC with respect to this question with which it concurs.

c) Interference Resolution

The Department is considering requirements for BPL operators to address potential interference complaints. In particular, individuals and organizations with complaints would be asked to directly contact Access BPL operators to investigate and resolve problems. If a problem could not be resolved satisfactorily or in a timely manner, the Department would address the problem as an interference complaint under the Radiocommunication Act.

The Department seeks comments on:

- 1) Its proposal that individuals and organizations refer problems to BPL operators to investigate and resolve matters on a timely basis; and**
- 2) What other approaches could be taken to ensure the resolution of interference complaints?**

Please provide rationale.

22. For the satisfactory and timely resolution of suspected Access BPL interference and elimination of actual Access BPL interference, the BWA recommends that each Access BPL operator be required to provide a single telephone point of contact for each deployment area in addition to the e-mail address required for purposes of frequency coordination with local authorized radio services. The telephone point of contact should be required to receive complaints of suspected interference and be capable of accomplishing rapid diagnosis during

the same telephone session, or soon after, by a mutually agreed schedule. Specifically, upon receiving such a telephone call, the Access BPL operator should be required to perform or schedule a test in which the frequencies of the suspected BPL interference sources are changed to determine whether the test would eliminate the interference problem. Alternatively, the Access BPL operator could perform another type of test by briefly deactivating the suspected interference sources during a period with little traffic. These simple tests would determine whether the interference is caused by the Access BPL system. The BWA understands that NTIA has sufficient evidence that shows such a requirement is practicable and effective.

23. In the event of unsatisfactory resolution of interference complaints, the BWA supports the option described in the RABC response to this question involving the Department's cooperation in the prompt resolution of interference complaints.

Industry Canada believes that establishing a publicly accessible database would assist in the timely resolution of interference complaints. Therefore, the Department is of the opinion that a database of BPL installations should be developed and maintained.

The Department seeks comment on the establishment of a publicly accessible database and its potential to ensure the timely resolution of interference complaints. In particular:

- 1) What specific information should be included in the database?***
- 2) How could the information be accessed and who should have access to the database?***
- 3) Who should develop, maintain and manage the database?***

Please provide rationale.

24. Similar to NTIA's suggestion on the above subject, each Access BPL operator should be required to be an industry-recognized entity and information on each proposed Access BPL system should be included in a publicly available database, within 30 days prior to the initiation of service. Such information should include information on the Access BPL equipment to be deployed, such as, modulation types, numbers of carriers, minimum and maximum carrier spacing, symbol rates per carrier, range of duty cycle, the multiple access technique, etc. The information to be notified should also include the planned Access BPL system locations in the form of postal codes and geographical coordinates. Finally, each notification of Access BPL deployment should include a single telephone point of contact for each deployment area and an e-mail address.

25. The Access BPL industry should be required to establish a centralized publicly accessible Access BPL notification database prior to the initiation of any Access BPL service. The responsibilities and duties of the database manager are to maintain complete, accurate and timely record of the required notification information. The database manager should be required to enter the notification information into the database within a specified period, for example, within three business days of receipt.

Conclusion

26. The BWA recognizes that the Access BPL service could emerge as a viable third broadband wire-based service into the home. Notwithstanding, there are serious interference concerns regarding Access BPL operations arising from the fact that electric power lines are not shielded. Even though the Access BPL systems are intended to be operated by conductance over power lines as unintentional radiators, the power lines act as antennae and portions of RF energy can be radiated to cause interference to authorized radio and non-radio services. The BWA is particularly concerned about the potential of interference from Access BPL systems in the telephone network carrying DSL and VDSL services, as discussed above.

27. Nevertheless, the BWA supports the Department's proposals which are understood to be influenced by the NTIA reports and the FCC's rules in their Report and Order for Access BPL systems (R&O). The BWA would urge the Department when finalizing its proposals to take into consideration, specifically, the NTIA's Phase 2 study on "evaluating the effectiveness of newly adopted rules in reducing the risk of BPL interference" which is reported to be nearing completion, and the FCC's upcoming review of several petitions for reconsideration of their R&O.

28. Finally, the BWA recommends that all competitive entities should have equal right of access to and use of Access BPL systems subject to equitable terms and conditions.

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