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1-888-902-5768
www.rabc.ottawa.on.ca

Radio Advisory Board of Canada **Conseil consultatif canadien de la radio**

2005-09-07

File: 2000

Mr. Larry Shaw
Director General Telecommunications Policy
Industry Canada
300 Slater Street,
Ottawa, ON
K1A 0C8

Subject: **Radio Advisory Board of Canada Response to Canada Gazette Notice: DGTP-001-05 dated 2005-05-14 Consultation on a Renewed Spectrum Policy Framework for Canada and Continued Advancements in Spectrum Management**

Dear Mr. Shaw;

The Radio Advisory Board of Canada is pleased to respond to Canada Gazette notice DGTP-001-05. The Board commends the Department for proposing to update this important document.

The Board's response, prepared by a Joint Working Group, is attached.

This response was balloted to Board members. Fourteen of the RABC's 21 members responded, as follows: 11 Approved, 3 Approved with comment, there were no abstention or disapprove ballots.

The Sponsor Member's comments (which form in integral part of the RABC's response) are:

From BTG:

Please refer to BTG for more comments in their direct submission. They may vary from RABC in which case their submission takes precedence.

From CBC:

The CBC understands the challenges of introducing future technologies into existing spectrum allocations. The CBC supports the RABC's contribution and comments to DGTP-001-05 especially those relating to the spectrum used by Broadcast Services. The CBC would also like to remind the department that Broadcast Services are also evolving, moving fast into the digital age. Finally, the CBC urges Industry Canada to always ensure compatibility of future allocations with international decisions at ITU, CITEL and WRC.

Radio Advisory Board of Canada **Conseil consultatif canadien de la radio**
116 Albert Street, Suite 811 ☎ Phone: **+ 613 230 3261**
Ottawa, ON ✉E-mail: **r.a.b.c@on.aibn.com**
K1P 5G3 🖷 Fax: **+ 613 230 3262**
💻Web site: **http://www.rabc.ottawa.on.ca/**

From CEA:

Priority access to mobile and fixed service spectrum is very important to electric utilities and their customers. Both services are essential for the safe and reliable operation of the electrical grids. This access is very important during normal operations and particularly so during times of emergency when power has been lost or "blacked out". With the electrical grids being increasingly 'pushed' to their limits, and with limited power resources in some parts of the country, the need for priority access to spectrum to operate these systems is even more important. The critical functions of teleprotection, Supervisory Control and Data Acquisition, and mobile radio are essential for operating the electrical grids and safely restoring them after outages. It has been proven in many instances that the utilities can not rely on the systems provided by public carriers as, during emergencies, these systems are either blocked or unavailable due to damage, congestion or consumption of their backup power. In addition, under normal operations the public systems do not provide the required level of reliability. As a result, the electric utilities must rely on their private fixed and mobile systems.

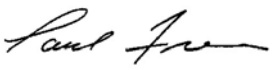
Remark also that in the U.S., electric utilities are classified as public safety systems.

It is recommended that the following clauses be modified as follows:

6.2.3.2

Radiocommunication systems vital to sovereignty and national security, National Defence, law enforcement, public safety, emergency response **and critical infrastructure such as electric utilities** will be granted high priority and support in the access and use of the radiofrequency spectrum. The Department will encourage service interoperability among **industry identified** communication systems as required.

Yours truly



Paul Frew
President

Radio Advisory Board of Canada Response to
Canada Gazette Notice: DGTP-001-05 dated 2005-05-14
Consultation on a Renewed Spectrum Policy Framework for Canada and Continued Advancements in Spectrum Management

The comments which follow are keyed to Parts and Sections of the consultation document.

Comments

Part A – Revision to the Spectrum Policy Framework for Canada

The Board remains, generally, satisfied with the 1992 policy and the 2002 revisions thereto. The Board recognizes that circumstances have changed, giving increased importance to national security and public safety issues, and to regulatory reform to take account of globalization.

It is understood that a high level document like the Spectrum Policy Framework will contain some overarching principles with a fair degree of generality that are intended to guide policy making in particular bands, or that deal with particular radicommunication services. The present proposal for a Renewed Spectrum Policy Framework does indeed begin with such principles but it introduces a number of them which tend to confuse the reader in the absence of any clear definitions. In the first few pages, the reader is introduced to "core objectives" "policy guidelines", and "policy statements" all of which are departmental creations distinct from the statutory "objectives" enumerated in section 7 of the *Telecommunications Act* which are referred to in sub-section 5(1.1) of the *Radiocommunication Act.* There appears to be a hierarchy between these various principles but that is not clearly spelled out. The RABC suggests that the Department consider defining each of the categories enumerated above and explaining very briefly the interrelationship between them. This will assist industry representatives to understand better the policy foundation upon which the Spectrum Policy Framework stands and help them in their task of advising the Department on particular spectrum policy proposals.

6. Proposed Changes to the Framework

6.1.1 The Board agrees with the proposed preamble, i.e.:

> ***In managing the radiofrequency spectrum by the powers conferred by the Radiocommunication Act, with regard to the objectives of the Telecommunications Act and related legislation, the Department will adhere to the following core objectives and policy guidelines in establishing policies, procedures, regulations and technical standards.***

6.1.2 The Board is broadly supportive of the objectives listed in 6.1.2 but suggests that they might be revised as follows, bearing in mind that this is not an order of priority and the Board has explicitly removed the numbers to reinforce that point:

> ***To promote and support the orderly development and efficient operation of radiocommunication systems and services to provide economic, social and cultural benefits for Canadians;***
>
> ***To regulate wisely and only when required;***

To ensure that radiofrequency spectrum is available in an affordable manner to support Canadian sovereignty, security and public safety needs;

To facilitate, through flexible frequency management tools and regulations, the use of spectrum to implement advanced communications services for the benefit of all Canadians in all communities and regions of Canada, including the most remote areas and off-shore installations;

To advance Canadian spectrum interests internationally;

To promote economically efficient resource allocation and reliance on market forces and economic incentives to assign the spectrum, where such actions will enhance the economic social and cultural benefits for Canadians; and

To consult widely on a regular basis.

The Board understands that all users, including Radio Amateurs, hobbyist and experimenters are covered in the broad definition of social and cultural benefits.

There are concerns expressed by members of the RABC that "total" reliance on market forces and economic incentives for assigning spectrum may not be in the best interest of Canadians from a national security, public safety, public service, scientific and cultural perspectives. A more balanced approach by the Department is recommended to ensure that the needs of these communities are met

6.2.2.2 Proposal

New Policy Guideline 1 - Allocation of Frequency Bands to Radio Services

The Board agrees with the text in NPG 1.

New Policy Guideline 2 - Designation of Spectrum to Usage

The Board welcomes the Department's commitment to provide licensees the flexibility to adapt their service offering to meet changing demand. This is particularly important for public wireless services considering the rapid rate of development within the wireless industry and the trend for service convergence. We understand that the Department has followed a long-standing policy of designating spectrum by use rather than user, to enable access to spectrum by a greater number of potential users. We recommend that the arrangement where licensed cellular type carriers are assigned spectrum blocks on non-sharing basis will continue, which is most compatible with network infrastructure. This would continue to optimize the use of the radio spectrum for better efficiency.

New Policy Guideline 3 - Radio Systems or Services Displacement

From time to time spectrum needs to be reallocated to achieve policy objectives and existing users must be displaced. In most cases there are economic and regulatory mechanisms which make such displacement possible. In a few cases, however, different factors apply:

- For example, in the case of Broadcasting, the Board considers that frequency or channel displacements that might be imposed by the Department during a broadcast license term could jeopardize the ability of a licensee to meet certain technical and non-technical conditions of license that may have been imposed by another government agency, the CRTC, through its own regulatory processes. Moreover, the main impact of such changes often falls on the general public, since listeners/viewers are obliged to make adjustments to their receiving equipment and/or usage habits. This situation does not occur to the same extent with non-broadcasting services, since the Department has exclusive regulatory authority over these licensees and the equipment they utilize. Consequently, the Department's spectrum management policies should consider, with respect to the displacement of broadcasting services, the special needs of the Broadcasters.

- The board also considers that wireless network operators, broadcasting, public safety and national security services and systems may need to be treated with special considerations when absolutely necessary to displace them. For instance, the Department could allow new entrants to provide compensation to incumbents for relocating earlier than otherwise would be required. However, such compensation should not be mandatory. Another form of compensation could be that the Government redirects some of its auction proceeds or provides grants to displace licensees sooner than otherwise would be required.

- The board recommends to the Department to give special attention to passive EESS service as the relevant frequency bands used by EESS are mainly determined by fixed physical properties (e.g. molecular resonance) that cannot be displaced or ignored.

In the existing guideline 7 the Department needs compelling reasons to consider displacement. The Board recommends NPG 3 be changed from "only where necessary" to "only when there is a compelling requirement".

New Policy Guideline 4 - Economic Principles of Spectrum Management

The Board is supportive of the Department's intent to apply "market forces" and "economically efficient resource allocation" to spectrum management but recommends that this be tempered with an assessment of the "economic, social and cultural benefits for Canadians" of various proposals and that nothing be undertaken by the Department that would create any economic distortions within the existing Canadian wireless industry. When assessing benefits for Canadians and using "market forces" and "economically efficient resource allocation", the board assumes that the Department will identify and take into account impacts on affected services.

There appears to be little or no concern about recovery by Industry Canada of the legitimate cost of spectrum management. The Board also notes that charging economic rents for spectrum beyond those needed to pay for spectrum management services and encourage spectrum efficiency may be inconsistent with the objective of development of telecommunication systems that confer economic, social (including public safety and national security) and cultural benefits on all Canadians and with New Policy Guideline 9. This is not meant to imply that commercial systems do not provide economic, social, safety, or cultural benefits to Canadians. In fact, much of Canadian society depends on commercial systems for family and personal business communications and access to emergency services such as 911 and other public services such as 211, 311, 511 and 811. Further, commercial systems have and are increasingly being used by public safety for both day to day and emergency communications. Applications such as wireless

priority service (WPS) and the proposed Public Alerting service in a commercial wireless system have and are being developed as well

New Policy Guideline 5 - Licensing Process –

The Board agrees with Policy Guideline 5 but proposes that the Department should clearly state that none of the licensing processes covered by this guideline will apply where other licensing regimes currently exist, such as the comparative review process which already occurs as part of the CRTC's broadcast licensing process.

The Board suggests that national security and public safety users should not be subject to competitive licensing process even in situations where demand exceeds supply. The Department should ensure that allocation of spectrum is aligned with any approved strategy for public safety radiocommunications.

The Board encourages the Department to proceed, with all considered haste, with automating the licensing process. In the case of satellite services, and due to their required extensive filing process with the International Telecommunications Bureau, the Department should consult with the industry representatives on best methods of automating the licensing process to eliminate duplications to the extent possible and improve the efficiency of this process.

New Policy Guideline 6 - Facilitating the Use of Spectrum –

The Board agrees with the Department's proposal to provide opportunities for secondary market trading where appropriate. In the Board's view, the development of secondary markets for spectrum will facilitate the movement of spectrum to those who will use it most efficiently, thereby maximizing the benefits to the Canadian economy of this resource. The Board further notes that the development of secondary markets is consistent with the Department's objective to rely on market forces and economic incentives to promote efficient resource allocation.

The Board also agrees with the Department's intention to provide licensees with as much certainty as possible thus enabling licensees to plan for the long term. The Board further recommends that, if secondary market trading is to be successful, any process governing such transactions has to be voluntary, simple, expedient and, to the greatest extent possible, driven by commercial rather than bureaucratic considerations. We believe that such an approach will be easily adaptable to changing market requirements and will support innovative commercial arrangements between parties.

On page 24 of the Policy and Licensing Procedures for the Auction of Spectrum Licences in the 2300 MHz and 3500 MHz Bands the Department states "In the past the Department has interpreted the transfer of a licence to include any leasing, subleasing or other disposition of the rights and obligations of the licence. The Department is planning to consult to determine whether this interpretation will continue to apply for this licensing process and future licensing processes." This interpretation is an unnecessary restriction on commercial arrangements between parties as long as meeting the obligations of the Licence Conditions are provided for in such an agreement. The Board urges the Department to consult quickly on this matter as the removal of this barrier will assist in the development of healthy and vigorous secondary spectrum markets.

New Policy Guideline 7 - Timely Release of Spectrum

The RABC supports the intent of this Policy Statement and proposes that it be modified to include the following principles:

- The timely release of spectrum is of particular importance to support new technology applications and to sustain the growth of applications which are market-based, in accordance with commitments given in Policy Guideline 4.

- Such timely release should include a commitment by the Department to a reasonable date for availability, recognizing the numerous steps that are required.

With respect to the statement: "Spectrum will not be withheld, except where necessary to satisfy specific policy issues", the Department is requested to provide a rationale and examples.

6.2.3 Making Spectrum Available to Meet Priority Requirements and Societal Needs

6.2.3.1 Discussion

The Board is fully supportive of the need for the provision of spectrum to meet priority requirements and agrees with the Department's proposal for achieving this goal, while also ensuring access to meet societal needs that would not otherwise be achieved by market forces alone. The Board views this as requiring continued sharing among authorized services in the increasingly crowded bands between 100 MHz and 50 GHz. Some of the priority requirements will be partially fulfilled by non-market driven services such as the amateur service, radio astronomy service and earth exploration satellite service, whose contributions to scientific, security and emergency communications are well known. Many applications within these services require extremely sensitive receivers and a low noise floor. In considering the increased access of low-power licence-exempt devices in support of priority requirements, the Board urges the Department to consider how best to integrate these innovations while preserving the technical performance requirements of existing services. The Board suggests that some exclusive allocations will continue to be necessary.

New Policy Guideline 8 - Priority Communication Services

Security/defence and public safety systems are provided by a mix of 'private' (government/agency owned and operated) systems and leased (from commercial vendor or service provider) systems. The priority afforded through this guideline applies to all such systems without regard to ownership.

The RABC agrees with the principle but suggest a revision to the words:

> ***Radiocommunication systems vital to maintaining sovereignty, national security, including ~~National D~~defence~~,~~; and law enforcement, public safety and emergency response services will be granted the highest priority and support in the access and use of the radiofrequency spectrum. The Department will encourage service interoperability among radiocommunication systems to promote operational effectiveness and spectrum efficiency ~~as required~~ and will encourage the use of commercially available radiocommunications services and systems when available and appropriate.***

The Department must recognize that many national security and public safety agencies are tied to interoperability plans and operational requirements which may mean that some degree of spectrum inefficiency must be tolerated, at whatever cost, to maintain operational effectiveness.

The Board suggests that the Department provides adequate interoperability spectrum and streamline the licensing processes associated with interoperability/mutual aid/ emergency operations in order to encourage and facilitate interoperability amongst first responders and disaster relief organizations Affordability of spectrum is an important practical issue for the deployment of day-to-day communications and for interoperability facilities for disaster relief and with volunteer groups such as Search and Rescue associations. Licensing charges for these Interoperability channels could be waived by the Department

New Policy Guideline 9 – Availability of Advanced Communication Services for all Canadians

The Board agrees with the text in NPG 9.

6.2.4 Improving the Utilization of the Spectrum Resource

6.2.4.1 Discussion

The Board supports approaches that increase spectrum utilization. However, the Board has serious concerns about the "noise temperature" or "interference temperature" concept which would move the regulation of interference from transmitters to receivers. The interference temperature concept poses many difficulties, which should be addressed and resolved before the concept of "interference temperature" is used as a protection criterion for the sharing of spectrum between networks, or between networks and unlicensed devices. The Board requests that this concept not be implemented without further consultation. For a more detailed discussion on the use of "interference temperature" see §11.7.

The Board recognizes that radio receiver and transmitter standards are equally important for the efficient use of radio spectrum. However, considering the need for harmonization with the US, Canada decided years ago that receiver standards should not be mandatory. The Board considers that changes to this principle, also, should be made only after public consultations.

New Policy Guideline 10 –Facilitating Advances in Technology

The Board agrees with the text in NPG 10 but recommends further consultation and trials on advanced technologies such as software-defined and cognitive radio. These technologies may very well augment the use of the radiofrequency spectrum but the Department must ascertain that they can coexist without unacceptable interference to other licensed use.

New Policy Guideline 11 - Radiocommunication Standards

The Board agrees with the text in NPG 11

New Policy Guideline 12 – Increasing Spectrum Utilization

While the Board fully supports the promotion of the efficient use of radiofrequency spectrum, it questions the appropriateness of establishing conditions of licence for radio station installation and commencement of service in an environment where market forces and economic rents exist. It notes the Department's statement in the rationale for Policy Guideline 4 that "*The Department's intent is to rely as much as possible on market forces and economic incentives in spectrum management*".

Further, the use of implementation in a timely fashion and within certain time periods should be tempered, taking into account the current market and real world constraints on implementing the radio system. For instance, with satellite radio systems, a long lead time is needed to negotiate contracts, manufacture and launch the satellite. Many of these are not within the control of the licensee. It is suggested that "*reasonable period*" be qualified by adding ***"taking into account the market, technology development, manufacturing, implementation and roll-out time for the service."***

New Policy Guideline 13 - Interference Mitigation and Frequency Coordination

The Board agrees with the text in NPG 13.

Where holders of licences are expected to coordinate amongst themselves, the Department should be prepared to develop and provide clear guidance on the technical standards and coordination process and as well is expected to remain the main arbitrator in cases of disputes.

6.2.5 Delivery of the Canadian Spectrum Management Program

6.2.5.2 - Proposal

New Policy Guideline 14

The Board agrees with the text in NPG 14.

New Policy Guideline 15

The Board agrees with the text in NPG 15. This exchange should include the use of modern secure file server technology for the exchange of draft documents for both national and international discussions.

New Policy Guideline 16

The first sentence in the current PG14 is more pertinent than the proposed NPG 16, in that there is support for "national security & economic/market conditions". We believe that some of the prior text provides powerful support for proactive participation in international fora e.g. CITEL and ITU-R, rather than simply in bilateral fora.

Part B – Consultation on Advancing the Canadian Spectrum Management Program

11.1 Harmonized Use of the Radiofrequency Spectrum

The Board recommends that the proposal should be amended to read:

> ***Canada should continue to identify the necessary steps to promote the harmonization of the use of radiofrequency spectrum on a regional and global scale, while promoting the maximum flexibility consistent with good spectrum management.***

Questions

(1) What steps can Canada take to further harmonize spectrum allocations, policies, standards and regulations to the greatest extent possible?

The Department has done an excellent job on harmonization. The collaborative efforts need to continue between industry and government in Canada and between Canada and other nations. Most harmonization and the most effective harmonization is driven by the needs of users and vendors' responses to them. Canada is uniquely successful in having a long established partnership between government and the industry – partially through the Radio Advisory Board of Canada. There needs to be an appropriate balance between bilateral/continental, regional and global harmonization – the degree of emphasis will vary by sector and the need for cross-border coordination.

In cases where the allocations and technical standards are the same, the Board recommends that the Department press for the establishment of regional certification standards for wireless products, such as those of the European Union. This would eliminate the need for multiple test reports, applications and labels for products sold throughout the region. Although global harmonization is desirable, a regional approach to certification may be more practical and achievable in the near term.

(2) How can Canadian interests be further advanced in the international fora responsible for developing standards and regulations for new wireless technologies and services?

Canada needs to maintain a high profile within the ITU-R and other regional and international organizations such as CITEL and NATO, by striving to play a leading role. Such an approach requires the continuous application of necessary resources of all kinds, including the financial support for international meetings held in Canada.

11.2 Licence-exempt Spectrum

Scenario

The Board agrees with the Department's view that the Canadian market is not large enough in most instances to be able to support the design, manufacture and deployment of products for unique Canadian licence-exempt bands. Nevertheless, the Board believes that Canada needs to assess the introduction of license-exempt devices and services judiciously, taking into account Canadian policy and usage of licensed spectrum. Hence, Industry Canada should consult broadly on proposed licence-exempt devices and services. As it has been the case with many other

services, the Canadian adopted solution may not necessarily align completely with regulations in the United States or elsewhere.

Notwithstanding the above comment, the Board offers the following concerns for the opening of new bands or frequencies for licence-exempt operations:

- Tragedy of the commons – the board realizes the importance which licence exempt spectrum plays for Canadians, but specific bands of LE spectrum may become more and more unusable over time. There are already complaints in the 2.4 GHz band for example. If this problem materializes, most likely only in urban areas, there is a concern that consumers may be disappointed in technology, equipment or products that they felt they could use over the long term. Is this in the public interest? Further if this problem does materialize and the spectrum becomes virtually unusable then this becomes an inefficient and wasteful use of our public resource. Even worse, it may also create public pressure to allocate additional LE spectrum to alleviate the difficulties created for these consumers which could potentially lead to a vicious cycle as this new band is exposed to the dangers of over use and over crowding.

- Economic distortion and unfairness – newer technologies and interference management techniques are assisting in reducing the need for exclusive spectrum to implement certain services. It remains to be seen whether this is just pushing the tragedy of the commons impact out further in time as noted above or will indeed minimize interference on an ongoing basis. There are Canadian wireless service providers who have paid large sums for exclusive spectrum either through spectrum auctions or high licence fees. LE spectrum, from which Industry Canada is not recovering any economic rents is being used to compete with or offer services similar to those offered in exclusively licensed spectrum. This undermines the business models based on exclusive spectrum and creates an economic distortion and may well undermine ongoing investment in exploitation of licensed spectrum. Industry Canada needs to find a way to offset this imbalance and collect economic rent for LE spectrum (reduced appropriately to allow for the fact it is non-exclusive) or alternatively preclude the use of this spectrum from creating undesirable economic distortion as described.

- Other Considerations - the Board notes that, despite its own comments on some specific issues, managing the spectrum has always involved merging the interests of incumbents with the needs of new entrants. Licence-exempt spectrum is extremely attractive because it allows vendors to bring new products to market quickly and economically – in direct response to Canadians' demands. On the other hand, licence-exempt spectrum usage is not amenable to remedial action by the Department in the event that interference problems are uncovered once the licence-exempt devices are authorized and in use. It is therefore incumbent upon the Department to exercise extreme care to apply *a priori* technical standards to licence-exempt devices that will ensure that licensed spectrum users sharing the band or in adjacent bands are protected. For each spectrum band, the Department must determine whose interests predominate:

    - Corporations which have paid for their licences and their customers who have an expectation of continued service without additional degradation; or

    - Canadian consumers who want, and often need, to use new, innovative radio services.

Proposal

The Department will continue to monitor the need for licence-exempt bands or frequencies and make them available for use on a timely basis.

The Board recommends that the proposal should be amended to read:

> ***The Department will continue to monitor the need for licence-exempt bands or frequencies and make them available for use on a timely basis, consistent with adequate protection for licensed services.***

The Board agrees, subject to the comments and caveats above, with the above proposal for making appropriate licence-exempt spectrum available on a timely basis.

Questions

3) What additional spectrum should the Department make available for licence-exempt devices and what regulatory and technical provisions should be adopted for their use? Does this include consideration of currently licensed spectrum, and if so, what provisions could be adopted to facilitate transition to licence-exempt operation or band sharing between licensed and licence-exempt operation? Would a device registration process provide sufficient safeguards to licensed operations?

Additional Spectrum for licence-exempt devices

The following lists the additional spectrum for which the Department should undertake separate public consultations for making each specific spectrum available on a licence-exempt basis:

(i) 150 MHz Band Multi-Use Radio Service

In May 2002 the FCC had established rules under Part 95 for a new Citizens Band Radio Service named the Multi-Use Radio Service (MURS) using five sets of frequencies in the 150 MHz band (151.820 MHz, 151.880 MHz, 151.940 MHz, 154.570 MHz, and 154.600 MHz). MURS is defined as a private, two-way, short-distance voice or data communications service for personal or business activities of the general public. The Board understands that the Department would be undertaking a public consultation in the near future with a view to making the aforementioned 150 MHz spectrum available for providing a similar service in Canada.

(ii) TV Channels 2 to 59 for Advanced Communications in Remote Rural Regions

In the policy document SP-746 MHz on "Mobile Service Allocation Decision and Designation of Spectrum for Public Safety in the Frequency Band 746-806 MHz" that was released in October 2004 under the Gazette Notice DGTP-002-04, the Department had sought comments on the types of advanced broadcasting and telecommunications services that could be extended to Canadians in rural and remote communities using unused/unallotted TV broadcasting spectrum in channels 2 to 59. Based on the comments received the Department should consider undertaking a public consultation for the use of unused TV channels 2 to 59 in remote rural communities.

(iii) 3650-3700 MHz Band

The Board notes that in DGTP-008-04 issued in October 2004 the Department had raised a number of new spectrum issues for public comment, including the opening of the 3650-3700 MHz band for licence-exempt operations. The Board commented that the Department undertake a public consultation in the 3650-3700 MHz band for licence-exempt operations, subsequent to the FCC's finalization of rules in its related proceeding. It should be noted that the FCC in its Report and Order released on March 16, 2005 has adopted final service and licensing rules for the 3650-3700 MHz band under Part 90. Under the rules new terrestrial stations will be licensed on a nationwide, non-exclusive basis, with all licensees registering their fixed and base stations in a common data base. Further, to ensure efficient and cooperative shared use of this spectrum, all terrestrial operations will be required to use technology that includes a contention based protocol. The FCC has received several petitions for reconsideration of its rules for this band. The Board requests the Department to monitor the FCC activities for any possible revision to its final rules for this band, and subsequently to undertake a public consultation for similar use of this band in Canada.

(iv) 21.2-23.6 GHz Band

The Board further notes that in the aforementioned DGTP-008-04 issued in October 2004 the Department had sought comment on their proposal for opening a portion of the 23 GHz spectrum on a licence-exempt basis. The Board commented that in view of the need to accommodate the fixed systems operating under SRSP-318.5 that would be displaced under the provision of the revised SP 3-30 GHz policy, the Department should instead consider the review of the SP 23/38 GHz policy with a view to maximize the harmonization of the entire 21.2-23.6 GHz band with the FCC rules so that additional 23 GHz spectrum would be made available for the licensing of point-to-point systems on a first-come, first-served basis.

(v) 71, 81 and 92 GHz Bands

The Board also notes that in DGTP-008-04 the Department had sought comment on their proposal to open the bands 71-76 GHz, 81-86 GHz, and 92-95 GHz for fixed service operations on a licensed, non-exclusive basis. The Board commented that in view of the complex issues involved in the questions raised by the Department for the efficient utilization of these bands, the Board urged the Department to undertake a more comprehensive consultation for the development of efficient spectrum utilization and licensing policies for these bands.

Regulatory and technical provisions, transition and device registration issues

In bands where there are no incumbent licensed users, license-exempt operations in such bands generally would require the use of a few measures, such as user protocols and etiquette, power and emission limits, to permit the efficient use of the spectrum and to minimize interference to in-band and out-of-band users. However, in bands where there are incumbent licensed users, pure licence-exempt operations would likely not be feasible because of the requirement to protect in-band and adjacent band licensed users. Instead a hybrid approach for new users involving regulations with a mix of unlicensed and licensed concepts may be appropriate. These could provide for new non-exclusive licences with minimal regulatory entry requirements together with suitable protection measures such as, device registration, band managers, transition of

incumbents, etc. Each of these bands would require the consideration of the aforementioned measures that can be best addressed during its consultative process. For example, in bands used for mission-critical services the Department may want to restrict band sharing with licence-exempt operations.

In the crowded spectrum between 100 MHz and 20 GHz, spectrum sharing among authorized users has been the norm for many decades. The coordination rules among co-primary users in a given band have been well defined. Secondary users are well aware of the requirement that they avoid interfering with primary users. As the Department considers increased access to spectrum for licence-exempt operations, the question arises about interference to secondary users. While the requirements for licence-exempt devices to avoid interference to primary users are clear, the protection accorded to secondary users is not at all clear. In informal discussions at the ITU and with Departmental staff, it has not been possible to obtain a definition of secondary user status. That secondary users are authorized users is not disputed; to what protection they are entitled is not evident.

The Board considers that as the Department considers a marked increased in licence-exempt operations, the time has come to clarify the protection that should be accorded to secondary users in spectrum in which licence-exempt technology and devices are to be permitted.

(4) Would it be realistic to open some of the FCFS fixed microwave spectrum as licence-exempt operations where it may not align with the US market (e.g. some of the reserved 23 GHz band)? How could these installations be controlled so they do not interfere with US-licensed services along the border?

Further to the Board's comment under the Question (3) of this submission on the 21.2-23.6 GHz band, it should be noted that opening a portion of the 23 GHz band for license-exempt operations would require the use of guard bands to minimize interference to licensed 23 GHz systems, thereby adversely affecting the efficient use of the 23 GHz spectrum. Further, the use of license-exempt 23 GHz systems along the US border would be problematic from interference consideration as the entire 23 GHz band is channelized in the US for licensed operations. Therefore, in the Board's view it would be impractical to consider the opening of a portion of the 23 GHz spectrum for license-exempt operations. Instead, the Department is urged to harmonize the entire 23 GHz band with the US so that the additional 23 GHz channels could be used to accommodate the displaced fixed systems from the 18 GHz band.

(5) What means could be developed to ensure that licence-exempt consumer equipment in the field operates within established limits (e.g. e.i.r.p, antenna directivity, channel bandwidth, out-of-band emissions) and what flexibility should be permitted?

The Board believes that it is essential that technical standards be established for licence-exempt consumer equipment that protect licensed services in the same or other bands. Compliance with these standards needs to be confirmed through testing of sample units prior to their being offered for sale in Canada. Such equipment should also be designed so that alteration of technical characteristics (e.g. increasing the power levels) by the end user is made difficult. Proposed changes to the technical standards applicable to licence-exempt devices should be studied carefully by the Department and subject to public consultation if the proposed changes increase the potential for interference.

In the Board's view a equipment certification requirement could be specified for certification by the Department to eliminate significant interference to other in-band and adjacent band operations.

(6) *Should the Department consider existing or new licence-exempt bands with a view to facilitating longer communications ranges for licence-free devices or system applications unique to the Canadian environment, such as rural and remote broadband fixed wireless access?*

In the Board's view the Department should endeavour to harmonize, to the extent practicable, with similar FCC rules for facilitating longer communication ranges for licence-exempt operations in a rural/remote environment.

11.3 Increased Spectrum-Usage Flexibility in the Domestic Allocation of Spectrum and Spectrum Policies

Questions

(7) For which services and in which situations should greater flexibility of spectrum use be afforded?

The Board supports the Department's proposal "to continue to provide additional flexibility in the use of the spectrum while taking the licensing regime into account. Strive to achieve the appropriate balance between flexibility in the use of spectrum for new, as well as existing, licences while still meeting legal requirements and other policy objectives." The freedom to choose which technologies are employed and what services offered allow licensees to better respond to consumer demands and innovate at a quicker pace than would be the case without flexible spectrum use.

The Board considers that generally enhanced flexibility could be granted in cases where spectrum licensees are issued. With access to contiguous spectrum within a defined geographic area, licensees are better able to avoid deploying incompatible systems. In fact, in cases such as cellular/PCS, with a high degree of spectrum reuse over wide geographic areas, the licensees themselves are best equipped to make decisions about the nature of their networks.

With respect to the type and breadth of flexibility the Department should grant to licensees, the Board notes that in many ways, the answer is dependant on the Service definitions in the Radio Regulations. It is not always clear what is mobile and what is fixed, and if a device is portable, where does it fit. The ITU-R/SG-1 is re-examining all Service definitions. This work may provide guidance to the Department in this area.

(8) Under what situations and criteria would it be appropriate to consider extending this greater flexibility to existing licences?

Granting existing licensees enhanced flexibility is a greater challenge than providing flexibility to new spectrum assignments. The Board submits that the Department should be mindful of the potential for windfalls to accrue to incumbents in the event of increased licence flexibility.

11.4 Enhanced Spectrum-Usage Privileges

Questions

(9) Should the Department extend transferability and divisibility privileges to other licensees? If so, which should be considered the highest priority and what timing would be appropriate?

As a principle, whenever possible, the highest priority should be accorded to extending the transferability and divisibility privileges to spectrum where contiguous blocks may be available, one example is ESMR.

(10) Are the current privileges associated with both spectrum and site licences sufficiently defined (this may include technical and operation parameters) to facilitate access to spectrum, the ease of trading the spectrum and the flexibility to offer a range of advanced wireless services?

The Board has no comment.

11.5 Streamlining the First-Come, First-Served Licensing Process

Questions

(11) In which areas do you see the Department further improving the FCFS process?

The Board supports that the Department pursue its proposal for the feasibility of further streamlining the FCFS licensing process, specifically for accelerating license approvals for applications near the Canada/US border involving options outlined under "Scenario" in the consultation.

In its response to DGTP-002-04: Mobile Service Allocation Decision and Designation of Spectrum for Public Safety in the Frequency Band 746-806 MHz (SP-746 MHz), Question (c) *What planning and authorization mechanism should be used to ensure that public safety users are successfully accommodated*, the Board commented, *inter alia*:

> "The traditional first come, first served approach appears to have worked reasonably well in the past as an authorization process and should continue. However the Department may wish to consider a regional planning approach, bearing in mind that such an approach may introduce delay.
>
> The Department should consider streamlining the FCFS licensing process with the assignments released in the form of system or spectrum licences or other mechanisms that would provide more flexible and timely approach to the agencies in their area of operation. The administrative burden of the current scheme is quite high."

The Radio Advisory Board suggests that these comments can be applied in a general manner to Question 11.

(12) Are there other principles such as non-exclusivity, which can be applied to the FCFS process for authorization of spectrum on an area basis in situations where it would be normally anticipated that a competitive process would be required?

The Board supports such concepts as the use of non-exclusivity where appropriate, such as currently applied in the 38 GHz band and under consideration for the 4.9 and 5.8 GHz bands.

The availability of radio equipment capable of determining occupancy and dynamically switching frequency, as used in licence-exempt bands adjacent to the 4.9 and 5.8 GHz bands, makes these bands logical candidates for non-exclusivity, particularly considering the strong common interests of the user groups.

There may also be other cases where coordination within the user group would be readily possible, such as temporary links for broadcasting and emergency communications, etc.

11.6 The Roll-out of Licensed Radio Systems – Putting Spectrum to Use to Serve Canadians

Questions

(13) Is there a need to review and improve the current practice of placing roll-out requirements on licensees?

Yes. Rollout requirements are inconsistent with an environment where the Department's intent is to rely on market forces and economic incentives.

(14) Should the Department expand the use of mechanisms to make available unused spectrum, like it did with the new party cellular policy given in RP-019, which enables an entity to obtain a licence for otherwise unserved or underserved areas?

No, this undermines the integrity of national licences and is a bad idea. Industry Canada should find alternative solutions and appropriate incentives to accomplish such objectives.

(15) Given the increased usage privileges offered to licensees, should the Department continue to include deployment requirements as a condition of licence or, alternatively, rely on market forces to ensure that the spectrum moves to the highest valued use and user?

No. As indicated in our response to New Policy Guideline 12 and to Question 13, the Department should not continue to include deployment requirements as a condition of licence but should instead rely on market forces to ensure that spectrum moves to the highest valued use and user.

11.7 Implementation of New Technologies and New Spectrum Management Concepts

Questions and Comment

The Department invites comment and views on the development of new technologies and new spectrum management concepts and their potential impact on the use of spectrum and spectrum management.

Comment on Interference Temperature

The "noise temperature" concept, referred to also as "interference temperature", is a concept with several basic problems in its application. In general, it puts all the onus on the operator of a licensed receiver to take whatever measures he finds necessary to protect his network from harmful interference. This is very different from the current situation, in which the operator of a new transmitter is obliged to protect an existing licensed receiver.

Further, it is very difficult and in many cases impossible to measure the "interference temperature" into a network. This is in part because interference from other networks is in most cases a small portion of the internal noise of the network being interfered-with, combined with interference from natural causes. To determine the source or sources of the "interference temperature" is even more difficult.

Even if measurement of the interference temperature at a receiver input could be measured, there is no known action to take to correct a situation in which the "interference temperature" protection criterion is exceeded, because the interference temperature is in most cases a measure of the aggregate interference from many interferers. In that situation it would be difficult to require that a single interferer modify the technical characteristics or the operation of his network to correct the aggregate problem.

Using the "interference temperature" to control the interference from a large number of unlicensed devices is even more difficult, because the interference from an individual unlicensed device is likely to be transitory, with no identification.

In conclusion, the Department should examine in detail the above problems associated with the management of the radio spectrum in which "interference temperature" plays a part, before that concept is introduced in Canada. If the Department considers that the concept of "interference temperature" might have a role in Canada, the RABC requests that it have the opportunity to comment in detail before it is introduced.

(16) Which technologies have the most promise of facilitating the use and management of the radiofrequency spectrum?

The Board has considered the potential advantages and difficulties associated with the introduction of unlicensed UWB devices and has submitted detailed comments to the Department in response to **SMSE-002-05 – Consultation Paper on the Introduction of Wireless Systems Using Ultra-wideband (UWB) Technology**.

UWB raises a particular issue and that is that overlaying other users on top of currently licensed spectrum is problematic. Over and above the technical issues already outlined in the Board's response if Industry Canada does take such an approach this move should trigger significant rebates of auction fees and reductions in license fees for the no longer exclusive spectrum.

With respect to other technologies mentioned in this Policy Framework Consultation, such as cognitive radio and software defined radio, the Board notes that these are emerging technologies whose efficacy and interference potential remain unproven. The Board urges the Department to monitor carefully developments in these technologies and to provide to the public, in a future consultation, an opportunity to provide detailed comments on any policies and/or technical standards that the Department may propose to adopt relating to them.

(17) Are there other technologies or technical issues that the Department should be investigating?

In the Consultation the Department makes reference to the exploitation of the so-called "white space", for example by the opportunistic exploitation of licensed spectrum by licence-exempt devices that adapt to the interference environment. The Board has serious concerns about such an approach:

- First, it is not clear how the existence of "white space" would be determined, or even how it would be defined. The Board notes the serious technical difficulties associated with the proposed Interference Temperature concept that were discussed by a number of respondents to the FCC Interference Temperature process. The likelihood is that rather than increasing spectral efficiency, the outcome would simply be the imposition of a greater interference burden on the already-licensed services.

- Second, the imposition of such a sharing scenario introduces serious questions of monitor and control, particularly if the adaptive devices are licence-exempt. Even if theoretically, it could be demonstrated that adaptive techniques could improve spectral efficiency, it is not clear how the Department could ensure that the necessary technical standards would be met throughout the lifetime of the unlicensed device; nor how malfunctioning devices could be silenced. UWB raises a particular issue and that is that overlaying other users on top of currently licensed spectrum is problematic. Over and above the technical issues already outlined in the Board's response, as noted in question 16 above, if Industry Canada does take such an approach this move should trigger significant rebates of auction fees and reductions in license fees for the no longer exclusive spectrum.

As noted in its response to Question 16, the Board urges the Department to monitor carefully developments in these technologies and to provide to the public, in a future consultation, an opportunity to provide detailed comments on any policies and/or technical standards that the Department may propose to adopt relating to them.

The Board also notes that some RABC Members, like the Department of National Defence, are moving rapidly to exploit some new technologies and they are likely to be pioneers, providing useful 'live' test-beds for such further analysis. The Board's proposals for further consultation, etc, are not intended to delay the implementation of such new technologies by government agencies in exclusive Government of Canada bands.

(18) Which technologies seem the most appropriate in meeting the challenge of accommodating additional mobile and wireless access users in the VHF/UHF bands?

In meeting the challenge of accommodating additional mobile users in VHF/UHF bands, the Department could encourage increased use of shared systems. In bands dominated by heritage conventional systems (including simplex systems) such as at 150 MHz and 450 MHz, assignments are typically shared among several users, recognizing the low activity factors of many of these systems. Use of "smart" technologies employing cognitive radio to identify frequencies with low or no activity, combined with smart antennas or software defined radio capability could enable much more efficient use of these bands.

Such technologies will have regulatory issues which need careful consideration from the perspective of improving regulatory flexibility without eliminating key regulatory responsibilities. Regulatory consideration should start while these technologies are still immature

although economic commercial deployment may be several years away. Recognizing that there are public safety and commercial systems interleaved in these bands and the needs of public safety for unhampered real time communications, the Department may want to consider limiting initially the use of cognitive radios on public safety channels while the technology is proven. The introduction of digital modulation combined with multiple access techniques could yield much higher spectrum utilization.

At the same time, it must be recognized that trunking technologies as employed at 800 MHz and to some extent in the 420-430 MHz range already are spectrum efficient and this efficiency will increase with the shift to digital modulation and (possibly) different multiple access techniques.

The Department may want to reconsider the sharing of dissimilar technologies in the VHF/UHF bands such as paging and land mobile systems in the 150 MHz. This coexistence may not promote the best efficiency from a spectrum perspective and also from systems performance perspective.

11.8 Fostering Advanced Communication Services in Rural Canada

Questions

The Department seeks input on the following questions related to further clarifying spectrum policies and procedures, and establishing incentives to promote the extension of communication services to rural markets.

(19) Should the definition of "rural" (and "remote") to describe areas with unserved or underserved communications, be based on population density as measured by Statistics Canada? What would be a practical approach for implementation?

The Board notes that in DGTP-008-04 issued in October 2004 the Department had raised a similar proposal, namely, "the suitability of defining rural areas as those areas for which the population density does not exceed 400 people per square kilometre as measured by the latest Statistics Canada Census Report". The Board further notes that in commenting on this proposal, it had erroneously supported the Department's proposal due to an inadvertent error in computing the equivalent population density from the FCC's figure in its related '*Rural*' proceeding, which was subsequently not approved by the Board members during its balloting process.

It might be desirable to provide a more detailed comment at this time on the FCC's proceeding on "Facilitating the Provision of Spectrum-Based Services to Rural Areas and Promoting Opportunities for Rural Telephone Companies to Provide Spectrum-Based Services", commonly known as '*Rural Proceeding'*, since one of the key objectives in that proceeding was to develop an appropriate definition of a "rural area" for use in conjunction with some ten policies being addressed in that proceeding. In the Report & Order (FCC 04-166) released on September 27, 2004, out of eight potential definitions provided in the NPRM the FCC established a baseline definition of "rural area" as those counties (or equivalent) with a population density of 100 persons per square mile or less, based on the most recently available census data. The FCC's main reason for adopting this definition was that a definition based on county boundaries was easy to administer and understand. Also, population data based on counties were widely available to the public. Further, the total population of counties included under this definition of "rural area" closely tracked the Census Bureau's overall population for non-urban areas. However, the FCC recognized that the application of a single comprehensive definition for "rural area" might not be appropriate for all policies. Consequently, based on the comments received the FCC was

able to use the baseline definition of rural area for only one policy dealing with amending regulations to permit increased power limits in rural areas, while for most of the remaining policies the FCC decided to use appropriate rural definitions based on service-by-service or band-by-band approach in future proceedings. It should be also noted that the FCC's rationale for adopting the baseline definition of rural area might have been influenced by the FCC's use of this definition for some period as a proxy definition in its annual CMRS Competition Report for purposes of analyzing the average number of mobile telephony competitors in rural areas versus non-rural counties.

If it is felt desirable to harmonize with the FCC's baseline definition of "rural area", the figure of 100 persons per square mile would equate to about 39 persons per square kilometre. In the US the baseline definition of rural area is applicable to geographic areas called 'counties', the population data of which are readily available. In Canada, there may not be geographic areas equivalent to counties available in the census data for all provinces. Even if geographic areas equivalent to counties were to be developed for all provinces with assistance from Statistics Canada, care must be taken that using the definition of rural area, say 39 persons per square kilometre, such geographic areas would track the data for overall population for non-urban areas. Further, in view of the limited use of developing such a definition for one regulation or policy only, the Board does not see the usefulness of developing the definition of "rural" (and "remote") to describe areas with unserved or underserved communications, based on population density as measured by Statistics Canada, that could be applicable for a single policy only.

The Board considers that the Statistics Canada measures are inappropriate for radiocommunications systems. The Board proposes that it and the Department should adapt the existing RIC-27, as necessary, to provide a more useful base for **all** radiocommunication services and applications.

(20) What policy and regulatory treatment would create conditions that best promote the extension of modern communication services to rural (and remote) areas?

The Board considers a system of incentives would best serve to promote the provision of such services in Canada's rural areas. For services using spectrum licensed on a national basis this might take the form of fee relief in these areas plus credits for provision of services in such areas where such credits could be applied to fees levied in urban areas.

(a) *For example, should spectrum policies vary by geographic area according to the relative level of spectrum congestion or the demand for spectrum?*

Consistent with the Department's geographical differences policy, there may be situations where it is beneficial to vary spectrum policies in areas of low or medium spectrum congestion in order to promote economical usage of the spectrum in those areas. Therefore, the Board recommends that the department continue to implement flexible spectrum policies in low or medium spectrum congested areas where the benefits can be justified.

(b) *In what manner should the technical and/or operational parameters for spectrum management policies and standards for wireless installations be relaxed in rural (and remote) areas?*

The policies and standards for wireless installations required to minimize interference and maximize co-existence in spectrally congested areas often create economic hardships for a similar

installation in a rural or remote area. In some cases, the economic penalties will hinder or block the installation of a wireless system. For example, minimum antenna discrimination patterns for interference control dictate antenna choices, increasing the cost of the antennas, and in many cases increasing the costs of the towers to support them. Interference control can in most cases be managed using more economical antennas in remote areas.

Therefore, the Board recommends that provision be made for relaxed technical and/or operational parameters for all wireless services that may be installed in rural and remote areas. The parameters that should be relaxed are any parameters that would determine the costs of radio equipment, antennas, and/or support structures.

In no case should relaxed technical standards be allowed where their adoption might cause interference to existing spectrum users.

11.9 Access to Spectrum for Public Safety Services

It should be noted that the RABC had responded to similar questions in DGTP-002-04 - *Mobile Service Allocation Decision and Designation of Spectrum for Public Safety in the Frequency Band 746-806 MHz (SP-746 MHz*. In its comments, the Board stated that :

- *"additional spectrum for public safety – especially for spectrum which can be harmonized locally, regionally, nationally and on a continental basis,*
- *"the facilitation of interoperability through identification of interoperability spectrum as a fundamental measure.*
- *"adoption of common interoperability standards aligned with the ANSI standards adopted by the FCC in the United States.*
- *"The Department should encourage and facilitate interoperability between similar agencies, however should not mandate interoperability as an absolute prerequisite to licensing."*
- *"the current lack of a national or regional consensus on what is required to achieve interoperability makes it difficult to define the minimum operationally required elements of that interoperability."*

The Board suggests that these comments can be applied in general manner to Questions (21). (22) and (23). Additional comments are also provided under each question.

Questions

(21) Should the Department require that the licensing process for public safety systems consider the needs of the broader public safety community over larger geographical areas?

More and more, Public safety resources are called upon to respond to situations outside their normal areas of work. Considerations over broader geographical areas definitely need to be taken into account in the licensing process. This is not to say that Industry Canada should base its attribution of licenses solely on this principle, but every efforts possible should be made by Industry Canada to encourage the allocation of licenses in accordance with any agreed upon Pan-Canadian strategy that is in the process of being developed by PSEPC.

(22) Should the Department adopt standards which include the aspect of interoperability of public safety mobile systems?

The establishment of standards is definitely an important step towards enhanced interoperability. This said, the identification of the most appropriate standards should not rest on the shoulders of Industry Canada. It is the responsibility of the public safety community to agree on standards that will contribute to the enhancement of radio communications. As a starting point, focus should be put on agreed upon standards for the Interoperability Channels. Once again, Industry Canada should take any necessary means to promote the usage of those agreed upon standards.

(a) Should these standards be open standards to ensure that equipment from various vendors can operate on the same system?

Much progress has been made in the last few years in the identification of open standards. Those which are publicly available and free from intellectual property rights are especially valuable. This is definitely one of the most efficient ways to promote interoperability between various manufacturers and it should be encouraged. In addition to this, the identification of open standards has a positive effect on the acquisition cost of radio communication material as users can go to various vendors and acquire material that best meet their needs in a more open market. However, open technical standards alone cannot ensure that equipment from various vendors can interoperate on the same system - the only way is to apply interoperability standards (including conformance testing, interoperability testing, etc.).

(b) Should the Department, through its regulations or licensing process, ensure that interoperability is included as an aspect of the design of public safety systems?

As mentioned above, interoperability should not be the only standard but it should definitely be included as one of the aspects of the design of the systems.

The Board believes that the Department should encourage but not mandate interoperability standards, development of such standards are best left to the users.

(23) Should the Department identify common spectrum in the VHF and UHF bands (i.e. common to both Canada and the United States) to be used and shared in border areas for interoperability purposes, recognizing that currently spectrum in the VHF band is not aligned and that spectrum in both the VHF and the UHF bands is highly congested in densely populated areas?

Yes. It is important that spectrum is available for the interoperability purposes in the border area and in the rest of Canada. Designated spectrum for the interoperability along with agreed upon open standards would definitely facilitate interoperability amongst public safety and national security organizations

The Board notes that given the development of frequency agile and wideband RF equipment as well as the existence of ubiquitous (cross border, throughout NA and globally) commercial systems, common spectrum may become less and less of a constraint.

In so far as questions (22) and (23) are related, specifically, to ***public safety*** it is necessary to recognize that there are many different perspectives on public safety – including what is included. Public safety is more than police + fire + ambulance. The railways, for example, are recognized as a public safety service and the radio amateurs have an important public safety commitment. In

many jurisdictions gas and electrical utilities are treated as public safety users – especially when a gas line ruptures.

Most public safety systems are in the hands of local, municipal governments – large and small. Interoperability is just one of many factors which elected municipal leaders must consider when they decide to buy radio systems. Imposed standards which require higher costs are an unwarranted intrusion into local affairs unless they are accompanied by money to offset higher costs.

Open standards can provide the required levels of interoperability – required by the users – if the standards are ratified by a sufficient portion of the user community. Such standards would have a positive effect as it would allow multiple vendors to compete in an open market which would translate into lower costs (in the long term).

Conclusion

The Radio Advisory Board of Canada welcomes the opportunity to contribute to the development of a revised Spectrum Policy Framework. It is hoped that the comments above will be of assistance to the Department.

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