Consultation on a New Spectrum Licensing Approach and Fee for Narrowband Multipoint Communication Systems (N-MCS)
Notice No. DGRB-008-09 — Consultation on a New Spectrum Licensing Approach and Fee for Narrowband Multipoint Communication Systems (N-MCS)

This notice invites public comment on all aspects of the paper entitled *Consultation on a New Spectrum Licensing Approach and Fee for Narrowband Multipoint Communication Systems (N-MCS)*. This document outlines Industry Canada’s proposed spectrum licensing approach and fee for future N-MCS, including Automated Meter Reading (AMR) and Automated Meter Infrastructure (AMI) networks. Proposals outlined in this paper seek to address eligibility, licensing requirements, fees and other issues associated with N-MCS networks.

**Submitting comments**

Interested parties are invited to [submit comments](#) on proposals in the consultation no later than June 12, 2009, in electronic format (WordPerfect, Microsoft Word, Adobe PDF or XHTML) to the following e-mail address: Spectrum.Operations@ic.gc.ca, along with a note specifying the software, version number and operating system used.

Written submissions should be addressed to the Manager, Operational Policies, Radiocommunications and Broadcasting Regulatory Branch, Industry Canada, 300 Slater Street, 15th floor, Ottawa, Ontario, K1A 0C8.

All submissions should cite the *Canada Gazette*, Part I, the publication date, the title and notice reference number DGRB-008-09.

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April 2, 2009

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1. Intent

The purpose of this document is to seek public comments on Industry Canada’s proposed spectrum licensing approach and fee for all future narrowband multipoint communication systems (N-MCS). It should be noted that some N-MCS systems operate within licence-exempt radio frequency bands. Consequently, the licensing approach proposed in this document will not apply to such systems.

Consistent with the objectives of *Advantage Canada: Building a Strong Economy for Canadians,* this new N-MCS spectrum licensing approach and fee is being proposed to further improve the efficiency and effectiveness of these licensing activities.

2. Background and Context

The radio frequency spectrum supports a wide range of public and private sector activities. Under the authority of the *Department of Industry Act* and the *Radiocommunication Act,* Industry Canada manages the radio frequency spectrum and collects licensing fees for its use.

2.1 Legislation

Section 5 of the *Radiocommunication Act* grants the Minister of Industry the power to issue radio licences in respect of radio apparatus, spectrum licences in respect of use of specified radio frequencies within a defined geographic area, and any other authorization relating to radiocommunication that the Minister considers to be appropriate. The Minister is also granted the power to fix the terms and conditions of these radio authorizations, including the terms and conditions as to the services that may be provided by the holder thereof.

With respect to fees, section 19 of the *Department of Industry Act* grants the Minister the power to fix fees in respect of rights and privileges provided by the Minister under section 5 of the *Radiocommunication Act.* This includes fixing or amending fees pursuant to requirements of the *Financial Administration Act* and the *User Fees Act.*

3. Discussion

In order to facilitate the efficient development of radiocommunications and to ensure effective management of the radio frequency spectrum, the Department strives to apply the most appropriate economic and regulatory principles to maximize the benefits to society through the use of this resource.

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1 For the purpose of this document, narrowband means radio frequency channels with associated bandwidths equal to or less than 25 kHz.

As outlined in *A Spectrum Policy Framework for Canada* (SPFC), the Department manages spectrum in a manner that supports fair competition, captures economic rents where they exist and recovers spectrum management costs where such rents do not exist.

In November 2006, the Government of Canada released *Advantage Canada: Building a Strong Economy for Canadians*, a long-term, national economic plan to strengthen Canada’s economic future. To fulfill this objective, *Advantage Canada* outlines several key policy principles, including commitments to improve the efficiency of government operations, reduce unnecessary regulation and administrative burdens, and establish effective rules and competition policies.

The Department is of the view that continued application of apparatus-based radio station licensing for N-MCS systems in accordance with the *Radiocommunication Regulations* does not meet these objectives, as it is inefficient and can create an unnecessary burden for these licensees. N-MCS systems typically consist of a fixed central radio station (the “hub”) that communicates with several peripheral stations (“remotes”) located within a limited geographical area. An example of this type of system is an Automatic Meter Reading (AMR) network, which is often used by local utility companies to remotely monitor household electric or water usage. Instead of sending personnel to record household meter information, AMR systems use a fixed hub station within a community to wirelessly interrogate radiotelemetry devices attached to a household’s water or electricity meter.

Under a radio licensing regime, the utility company requires separate radio station licences for each hub and household remote station, and is required to pay prescribed licence fees. This approach can create an unnecessary administrative burden for the N-MCS system operator, and associated fees may be disproportionate to those charged for other radio services using a similar amount of radio spectrum in the same area. This is mainly due to the fact that, when applicable fee provisions of the *Radiocommunication Regulations* were originally developed, N-MCS networks involving tens of thousands of stations were not anticipated.

For example, based upon 2006 Canada census data, the City of Moncton, New Brunswick, has a population of 100,525 and approximately 44,677 households. Under a radio station licensing regime where prescribed licence renewal fees are typically $68 for one transmit and receive channel pair (combined bandwidth less than 10 kHz), fees for all associated household telemetry stations would exceed $3 million annually. In comparison, a bid of just over $5 million was recently accepted by Industry Canada for a 10-year licence to use 20 MHz of radio spectrum to service all of eastern New Brunswick (population 352,427) during the Department’s Advanced Wireless Services (AWS) auction.

To address some of the excessive administrative and financial burden faced by N-MCS system operators due to the radio licensing regime, Industry Canada developed a simplified licensing policy and procedure in 1995. In accordance with this procedure, N-MCS systems that respect specific technical parameters can be issued a single radio station licence regardless of their frequency band of operation, and fees are limited to a maximum value regardless of the number of associated remote stations.

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For example, if the AMR network noted earlier for Moncton were authorized in accordance with the simplified licensing policy, typically only one radio station licence would be issued for a fixed community hub station (assuming technical restrictions were met), and a corresponding maximum annual fee of $816 would be charged based upon the use of a single, two-way channel. This simplified procedure was primarily developed to address the then relatively few N-MCS system operators seeking radio station licences each year. Since implementation of the simplified process, however, Industry Canada has received an increasing number of requests for specialized N-MCS systems, some of which propose technical parameters beyond those currently permitted by the simplified licensing policy. Consequently, such requests cannot be approved in accordance with this policy and therefore must be authorized under the Department’s radio licensing regime.

A separate spectrum licence fee was also developed in 2000 for prospective N-MCS systems within the 1.4 GHz frequency band (1427-1430/1493.5-1496.5 MHz). Although more administratively efficient than apparatus-based radio licensing, this fee approach is limited to N-MCS operation in the 1.4 GHz band only, and the associated fee (see Canada Gazette Notice DGRB-003-015) is based upon use of 1 MHz-wide band segments and household density within spectrum grid cells. As service area boundaries proposed for N-MCS networks frequently do not correlate to that of spectrum grid cells, accurate calculation of serviced households can be difficult. As well, since service areas often include many cells, each with varying household densities, adapting this fee to equitably address the narrow channel bandwidths used by N-MCS networks (usually 25 kHz or less) can be problematic.

Consequently, the Department is of the view that a new licensing approach and fee, based upon population coverage within user-defined service areas, is required for future N-MCS systems operating in various frequency bands. Due to reduced propagation characteristics experienced by radio systems operating at higher frequencies, increased channel bandwidths are often required to ensure communication efficiencies that are comparable to systems operating in lower frequency bands. As a result, the proposed N-MCS licensing approach and fee should also consider channel bandwidth requirements of systems operating in various frequency bands.

### 4. Proposed Licensing Approach

In order to fulfill objectives outlined in *Advantage Canada*, Industry Canada proposes a new spectrum licensing approach and fee, available on a first-come, first-served basis to future N-MCS systems in all frequency bands. Such licensing would minimize the administrative burden, provide licensees with greater deployment flexibility, charge a fee that reflects fair economic rent, encourage efficient and effective spectrum use and provide greater licensing consistency for future N-MCS operations.

Although N-MCS systems typically comprise fixed stations only, mobile station operation may also be permitted provided that spectrum licence parameters and technical requirements are met and that these

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6 Households are defined by Statistics Canada as being equivalent to 2.5 people.

7 Spectrum grid cells are six-sided figures with an area of 25 km² that fit together in an interlocking pattern over the geography of Canada.
mobile units directly support fixed N-MCS operations. Mobile units will be considered part of a spectrum licensed N-MCS system, on a case-by-case basis, at the discretion of Industry Canada.

This new approach will apply only to future licensing of the N-MCS service. Strategies to effectively transition existing N-MCS licensees to the new approach may be the subject of future consultation. Once the new N-MCS spectrum licensing approach and fee have come into force, both the simplified licensing procedure developed in 1995 and the spectrum licensing process used for N-MCS operation within the 1.4 GHz frequency band will be discontinued.

4.1 Service Areas

Industry Canada is of the view that future N-MCS networks would be amenable to spectrum licensing on a regional/local basis. Licensees will be granted spectrum licence authority to use specific frequencies within user-defined service areas. Service area boundaries must be clearly defined by using standard geographical coordinates or other technically verifiable means (e.g. 25 km radius of specific latitude/longitude coordinates).

To facilitate confirmation of service area boundaries and coverage populations, licensees must also provide Industry Canada with electronic copies of proposed service areas in an acceptable Graphical Interface System (GIS) format. Such formats include MapInfo, ESRI Shapefile, AutoCAD Map or GML. Raster image formats, such as BMP, JPEG or TIFF are also acceptable provided that raster images contain landmarks (e.g. rivers, roads, etc.) to allow sufficient geo-referencing of service area images.

Although individual site-specific licences would not be required, technical site information for both fixed hub and remote stations must be provided upon departmental request.

Details regarding the general spectrum licensing process, technical details and the format required for submission of information are outlined in Client Procedures Circular CPC-2-1-23, Licensing Procedure for Spectrum Licences for Terrestrial Services.8

4.2 Licence Term

The Department proposes that spectrum licences for future N-MCS systems be issued for a one-year term, with licence fees payable by March 31 of each year.

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4.3 Eligibility

The Department proposes that N-MCS spectrum licences be issued to radiocommunication users, service providers and radiocommunication carriers. Note that eligibility criteria to hold such an authority are set out in sections 9 and 10 of the **Radiocommunication Regulations**. For further information, refer to Client Procedures Circular CPC-2-0-15, **Canadian Ownership and Control**, as amended from time to time.

4.4 Service Standards

As N-MCS systems typically operate on a point-area basis, the Department proposes that the existing standard used in conjunction with land mobile radio service applications be employed. This standard allows up to seven weeks for the issuance of a licence, effective the date that a complete application has been received, and for which coordination with a foreign administration or other agency is not required.

If, however, coordination with a foreign administration or other agency is required, such applications are usually processed within 13 weeks. This estimation is based upon typical processing time provided by foreign administrations or other agencies, and delays for specific licence applications may vary. It should be noted that delays due to the activities of a foreign administration or other agency are beyond Industry Canada’s control.

4.5 Licence Conditions

N-MCS licensees operating in accordance with the new licensing approach will be responsible for ensuring that they fulfill all applicable conditions of licence, as outlined in Appendix A.

5. Proposed Fee

As noted in the **Spectrum Policy Framework**, two of Industry Canada’s primary goals are to set fees that reflect the fair market value of the radio frequency spectrum being used and to promote the efficient use of this limited public resource. At the same time, the Department must also satisfy requirements of the **User Fees Act** and the **Financial Administration Act**.

During development of the proposed fee for future licensed N-MCS systems, the Department examined fees currently charged both domestically and in other countries (i.e. the United States, the United Kingdom and Australia). Internal departmental costs associated with development of the new regime were also evaluated. The following sections detail comparisons performed to arrive at the proposed licence fee.

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5.1 International Fee Comparison

In order to develop the proposed fee, Industry Canada considered those charged by three other countries: the United States (U.S.), the United Kingdom (U.K.) and Australia. It is important to note that this comparison is intended to be illustrative only, given the significant differences in service applications and spectrum management principles used by these Administrations.

5.1.1 United States

Licensed N-MCS systems use the 450 MHz, 800 MHz, 900 MHz and 1400 MHz frequency bands within which central hub stations are identified by call signs in the Private Land Mobile Radio Service, as part of either the Conventional Industrial/Business Pool or the Microwave Industrial/Business Pool. Licence fees for the Conventional Industrial/Business Radio Pool are US$200 per hub station whereas those for the Microwave Industrial/Business Pool cost US$1000 per call sign. It should be noted that licence fees in the United States are typically determined on an administrative cost-recovery basis only. Specialized or low power N-MCS systems that operate in accordance with specific conditions outlined in Part 15 of the Federal Communications Commission’s (FCC) Title 47 Code of Federal Regulations can do so as unlicensed devices that pay no fees.

5.1.2 United Kingdom

The United Kingdom allows both unlicensed and licenced operation of N-MCS systems. Unlicensed N-MCS system operation on a non-interference, non-protection basis is permitted in the 169.4-169.475 MHz band, assuming that less than 50 kHz bandwidth is occupied and a maximum transmit power of 10 mW is used. Unlicensed N-MCS systems pay no fees.

Licensed systems require a business Radio Remote Meter Reading Operator licence that permits operation in the 183.5-184.5 MHz frequency band. Associated fees are £8,000 (C$15,389) for each shared 200 kHz national channel or £80,000 (C$153,890) for an exclusive channel. Based upon current exchange rates and 2007 U.K. population estimates, this equates to a fee of C$0.00126/MHz/population for a shared licence or C$0.0126/MHz/population for an exclusive licence.

5.1.3 Australia

Australia does not separately license N-MCS systems. Rather, to the extent that these services are used, they are permitted either via a class licence (i.e. not licensed to individual users) or they are added to an existing 2G or 3G cellular service, so a specific N-MCS fee does not exist.

Regardless, it is possible to derive a comparable fee using its April 2008 Apparatus Licence Fee Schedule 1 for licensed point-to-multipoint networks. Based on equivalent use of 25 kHz of bandwidth in the 400 MHz band (assuming a 30-km service radius), a fee for N-MCS service in a high density population zone would cost approximately AU$2314 (C$2096). This fee consists of an administrative charge (AU$492) and a tax (AU$1822).

Based upon an average population of Australia’s three highest density cities (Brisbane, Melbourne and Sydney), an N-MCS fee of AU$0.035309/MHz/population (C$0.03198/MHz/population) can be estimated.
Table 1 provides a breakdown of respective N-MCS fees charged by each Administration.

Table 1: N-MCS Licence Fees for Selected Administrations

<table>
<thead>
<tr>
<th>Administration</th>
<th>Frequency Band (MHz)</th>
<th>$C/MHz/population (August 2008)</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>450, 800, 900, 1400</td>
<td>N/A</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>169.4 - 169.475</td>
<td>unlicensed 0.00126 (shared)</td>
</tr>
<tr>
<td></td>
<td>183.5 - 184.500</td>
<td>0.0126 (exclusive)</td>
</tr>
<tr>
<td>Australia</td>
<td>400</td>
<td>0.03198</td>
</tr>
</tbody>
</table>

5.2 Domestic Fee Comparison

In order to determine a fee value for future N-MCS systems, Industry Canada also considered fees currently charged for domestic fixed service systems that provide similar point-to-point or point-to-multipoint communications.

Annual licence fees for **Multipoint Communication Systems (MCS)** are $1.30/MHz for every 1000 households (or any portion thereof). This results in an approximate fee of $0.00052/MHz/population. Similar to N-MCS, MCS licensees are typically limited to fixed service applications.

Local **Multipoint Communication System (LMCS)** spectrum licensees are also restricted to fixed services. Annual fees for LMCS spectrum licences are $0.50/500 MHz/household or approximately $0.0004/MHz/population. Note that this fee is currently the subject of public consultation.11

**Broadband Wireless Access (BWA)** systems operating in the 38.4-40 GHz frequency range are issued spectrum licences restricted to fixed services whereas **Fixed Wireless Access (FWA)** spectrum licences are issued for use within the 3400-3550 MHz band. Annual fees for these types of licences are $120/50 MHz for BWA and $60/25 MHz for FWA respectively, for each spectrum grid cell associated with the intended service area. Consequently, the corresponding fee value in terms of $/MHz/population would vary depending on the population in the selected grid cells. However, if we were to use 2006 Canada census data for the population contained within the five spectrum grid cells that currently approximate the intended service area for Moncton, New Brunswick, the associated fee in this case would be $0.00012/MHz/population.

Table 2 provides a breakdown of respective fees currently charged to other domestic services.

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Table 2: Current Domestic Licence Fees

<table>
<thead>
<tr>
<th>Current Domestic Regimes</th>
<th>Frequency Band</th>
<th>$/MHz/population</th>
</tr>
</thead>
<tbody>
<tr>
<td>MCS</td>
<td>2500 MHz</td>
<td>0.00052</td>
</tr>
<tr>
<td>LMCS</td>
<td>28 GHz</td>
<td>0.0004</td>
</tr>
<tr>
<td>BWA</td>
<td>38.4-40.0 GHz</td>
<td>0.00012</td>
</tr>
<tr>
<td>FWA</td>
<td>3400-3550 MHz</td>
<td>0.00012</td>
</tr>
</tbody>
</table>

5.3 Proposed Fee for Future N-MCS Spectrum Licensees

The above examination of fees has resulted in a wide range of potential values. Given that the objective of the new approach is to provide spectrum licences for N-MCS systems regardless of the frequency band of operation, a fee should be determined that encourages efficient spectrum use, considers signal propagation characteristics of the various frequency bands being used, and reflects the relative value of these bands to prospective licensees.

In light of these considerations, Industry Canada proposes that a frequency band-based fee of $0.001/bandwidth unit/population be used, as indicated in Table 3. This fee would apply to each transmit frequency used within a licensee’s service area. The annual fee would be charged for each bandwidth unit used, or portion thereof, as applicable in the specified radio frequency bands outlined in Table 3. Annual fees will be calculated to the nearest dollar, with a minimum fee of $1000 for an N-MCS spectrum licence. Note that annual fee values may vary as Canada’s census information is periodically updated by Industry Canada.

For illustrative purposes, examples of the application of this proposed fee are provided in Appendix B.

Table 3: Frequency Band-Based Fee Schedule

<table>
<thead>
<tr>
<th>Frequency Band Used</th>
<th>Fee Rate($)/Population</th>
<th>Bandwidth Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1.0 GHz</td>
<td>0.001</td>
<td>1.0 kHz</td>
</tr>
<tr>
<td>1.0-5.0 GHz</td>
<td>0.001</td>
<td>5.0 kHz</td>
</tr>
<tr>
<td>Above 5.0 GHz</td>
<td>0.001</td>
<td>10.0 kHz</td>
</tr>
</tbody>
</table>

Industry Canada is proposing this fee to ensure that a fair economic rent is collected to reflect the value of spectrum used to meet anticipated annual demand for future N-MCS operations in the Canadian marketplace. Annual fees would be payable to the Department by March 31 of each year.

Based upon the proposed fee, 2006 Canada census data, and presuming an N-MCS system operating below 1 GHz with a total occupied channel bandwidth of 6.4 kHz, Table 4 provides examples of expected annual licence renewal costs in different service areas across the country.
Table 4: Examples of Licence Fees for Selected Canadian Service Areas

<table>
<thead>
<tr>
<th>Frequency Band of Operation</th>
<th>Permitted Occupied Bandwidth Unit</th>
<th>Total Bandwidth Units Required</th>
<th>National</th>
<th>Province of Quebec</th>
<th>Toronto</th>
<th>Vancouver</th>
<th>Moncton</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-1 GHz</td>
<td>1.0 kHz</td>
<td>7</td>
<td>$221,290</td>
<td>$52,823</td>
<td>$17,523</td>
<td>$4,046</td>
<td>$704 ($1000 minimum)</td>
</tr>
</tbody>
</table>

5.4 **Administrative Licensing Costs and Revenues**

Prior to implementing any new licensing approach and/or fee, Industry Canada expends significant resources to consult with stakeholders and develop appropriate spectrum usage policies, standards and licensing requirements. The *User Fees Act* requires that departments provide estimates of the administrative costs that they incur in providing services to clients. To determine these internal costs, the Department estimated the number of equivalent full-time person years required to implement the proposed N-MCS licensing policy over the next three years.

Revenue projections based on potential market demand for new N-MCS systems within this same period were also considered. Based upon anticipated N-MCS system growth in 20 Ontario communities over the next three years, with populations ranging from 39,000 to 278,000, an average population value of 104,000 people was determined. Calculation scenarios based on this average, and examples of typical N-MCS systems outlined in Appendix B were then used to determine fees ranging from a minimum of $1000 to $1,247 with an average of $1125, which resulted in a total of $22,500 for all 20 communities during the first year. As well, 37 other Canadian communities with similar N-MCS growth potential characteristics were also examined, resulting in a projected $37,000 of additional revenue for each of the subsequent second and third years.

These estimated cost and revenue values have been identified to ensure transparency and to fulfill requirements of the *User Fees Act*, and are highlighted below in Table 5.

**Table 5: Projected Three-Year Cost and Revenue Estimates to Licence N-MCS Systems**

<table>
<thead>
<tr>
<th>Year</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Projected Costs</td>
<td>$227,000</td>
<td>$55,000</td>
<td>$55,000</td>
</tr>
<tr>
<td>Project Revenues</td>
<td>$22,500</td>
<td>$59,500</td>
<td>$59,500</td>
</tr>
</tbody>
</table>

**Submitting comments**

Interested parties are invited to [submit comments](#) on the proposals in this consultation no later than June 12, 2009, in electronic format (WordPerfect, Microsoft Word, Adobe PDF or XHTML) to the
following e-mail address: spectrum.operations@ic.gc.ca, along with a note specifying the software, version number and operating system used.

Written submissions should be addressed to the Manager, Operational Policies, Radiocommunications and Broadcasting Regulatory Branch, Industry Canada, 300 Slater Street, 15th floor, Ottawa, Ontario, K1A 0C8.

All submissions should cite the *Canada Gazette*, Part I, the publication date, the title and notice reference number DGRB-008-09.
Appendix A - Proposed Conditions of Licence

In addition to the conditions of licence discussed earlier in section 4 of this document (eligibility, etc.), the following conditions will also apply to spectrum licences awarded through this process.

1. Licence Term

Spectrum licences for N-MCS systems are issued for a one-year term, and licensees must pay the annual licence renewal fee before March 31 of each year for the subsequent year (April 1 to March 31).

2. Compliance with Legislation, Regulations and Other Obligations

The licensee is subject to, and must comply with, the Radiocommunication Act, the Radiocommunication Regulations and the International Telecommunication Union’s Radio Regulations pertaining to its licensed radio frequency bands. The licence is issued on condition that the certifications made in relation to this licence are true and complete in every respect. The licensee must use the assigned spectrum in accordance with the Canadian Table of Frequency Allocations and the stated spectrum policy.

3. Technical Considerations

Licensees must comply on an ongoing basis with the technical aspects of the appropriate Radio Standards Specifications (RSS) and Standard Radio System Plans (SRSP), as amended from time to time. N-MCS radio apparatus must be approved by Industry Canada in accordance with Radio Standards Procedure RSP-100, Radio Equipment Certification Procedure, based upon either Radio Standards Specification RSS-119, Land Mobile and Fixed Radio Transmitters and Receivers Operating in the Frequency Range 27.4 - 960.0 MHz or other documents, depending on the intended radio service and frequency band of operation. As well, such systems must meet all spectrum utilization requirements outlined in the respective SRSP, as appropriate, for the band to be utilized.

4. Eligibility

A licensee operating as a radiocommunication carrier must comply on an ongoing basis with the eligibility criteria in section 10(2) of the Radiocommunication Regulations. The licensee must notify the Minister of Industry of any change that would have a material effect on its eligibility. Such notification must be made in advance for any proposed transactions within its knowledge.

A licensee operating as a radiocommunication service provider or radiocommunication user must comply on an ongoing basis with the eligibility criteria in section 9(1) of the Radiocommunication Regulations. The licensee must notify the Minister of Industry of any change that would have a material effect on its eligibility. Such notification must be made in advance for any proposed transactions within its knowledge.
Consultation on a New Spectrum Licensing Approach and Fee for Narrowband Multipoint Communication Systems (N-MCS)

For more information, refer to Client Procedures Circular CPC-2-0-15, *Canadian Ownership and Control*, as amended from time to time.

5. **Provision of Technical Information**

When Industry Canada requests technical information on a particular radio station or network, the information must be provided by the licensee according to the definitions, criteria, frequency and timelines specified by the Department. For more information, refer to Client Procedures Circular CPC-2-1-13, *Licensing Procedure for Spectrum Licences for Terrestrial Services*, as amended from time to time.

Licenses issued for systems operating within shared frequency bands will be required to submit technical information to the Department for all radio sites.

6. **Radio Station Installations**

While site-specific radio licences will not be required for each radio station, licensees must ensure that each radio station is installed and operated in a manner that complies with Client Procedures Circular CPC-2-0-03, *Radiocommunication and Broadcasting Antenna Systems*, as amended from time to time.

7. **Land-Use Consultation**

Industry Canada recognizes the importance of considering the potential impact of antennas and their supporting structures on their surroundings, and as such, has instituted land-use consultation procedures outlined in Client Procedures Circular CPC-2-0-03, *Radiocommunication and Broadcasting Antenna Systems*, as amended from time to time. Licensees must ensure that they meet all land-use consultation requirements specified in CPC-2-0-03.

8. **Mandatory Antenna Tower and Site Sharing**

Licensees who intend to operate as radiocommunication carriers must comply with the mandatory antenna tower and site sharing requirements set out in Client Procedures Circular CPC-2-0-17, *Conditions of Licence for Mandatory Roaming and Antenna Tower and Site Sharing and to Prohibit Exclusive Site Arrangements*, as amended from time to time.

9. **Radio Frequency Fields**

Health Canada has established safety guidelines for exposure to radio frequency fields in its publication entitled *Limits of Human Exposure to Radiofrequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz* (Safety Code 6). Although the responsibility for developing Safety Code 6 rests with Health Canada, Industry Canada has adopted this guideline to protect the general public.

It is the responsibility of the licensee to ensure that all related radiocommunication installations comply

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on an ongoing basis with Health Canada’s Safety Code 6 limits, including the consideration of combined effects of nearby installations within the local radio environment. At any time, licensees may be required, as directed by Industry Canada, to demonstrate compliance with Safety Code 6 by (i) providing detailed calculations, and/or (ii) conducting site surveys and, where necessary, implementing corrective measures.

10. **International and Domestic Coordination**

The licensee must comply with current and future agreements established with other countries. While frequency assignments are not subject to site licensing, the licensee may be required to furnish all necessary technical information data for each relevant site.

The licensee will use its best efforts to enter into mutually acceptable sharing arrangements that will facilitate the reasonable and timely development of their respective systems, where applicable, and to coordinate with other licensed users in Canada and internationally where applicable.

11. **Amendments**

The Minister of Industry continues to have the power to amend terms and conditions of spectrum licences (paragraph 5(1)(b) of the *Radiocommunication Act*).
Appendix B - Sample Fee Calculations

The following examples are based upon 2006 census data for Burnaby, British Columbia (pop. 202,799).

Example 1:

Hub station transmit frequency: 454.540 MHz, assigned bandwidth: 3.2 kHz
Remote station transmit frequency: 454.540 MHz, assigned bandwidth: 3.2 kHz

This system uses the same transmit frequency for both the hub and remote stations, and the same occupied bandwidth to facilitate operation. Consequently, the fee is based upon a total of four 1-kHz bandwidth units applicable for N-MCS operation below 1 GHz, and is calculated as follows:

$$4(0.001 \times 202,799) = 811.20, \text{ which is then rounded down to } 811.$$  

However, since this fee value falls below the permissible minimum, an annual fee of $1000 is applied.

Example 2:

Hub station transmit frequency: 454.540 MHz, assigned bandwidth: 3.2 kHz
Remote station transmit frequency: 454.540 MHz, assigned bandwidth: 6 kHz

Although this system uses the same transmit frequency for the hub and remote stations, the assigned bandwidths differ. As the occupied bandwidth necessary to facilitate operation is now 6 kHz, the fee is based upon the use of six 1-kHz bandwidth units applicable for N-MCS operation below 1 GHz, and is calculated as follows:

$$6(0.001 \times 202,799) = 1,216.79, \text{ which is then rounded up to an annual fee of } 1,217.$$  

Example 3:

Hub station transmit frequency: 220.2775 MHz, assigned bandwidth: 3 kHz
Remote station transmit frequency: 221.2775 MHz, assigned bandwidth: 3 kHz

In this case, two separate transmit frequencies are associated with this N-MCS system and the total occupied bandwidth necessary to facilitate operation (6 kHz) requires calculation based upon six 1-kHz bandwidth units applicable for N-MCS operation below 1 GHz. Consequently, the corresponding fee calculation is the same as above in Example 2.
Example 4:

Hub station transmit frequency: 220.2775 MHz, assigned bandwidth: 6 kHz
221.2775 MHz, assigned bandwidth: 6 kHz
Remote station transmit frequency: 221.2775 MHz, assigned bandwidth: 6 kHz
902.2775 MHz, assigned bandwidth: 25 kHz

In this case, although three different transmit frequencies are associated with this N-MCS system, 902.2775 MHz falls within the licence-exempt 902-928 MHz frequency band, and therefore cannot be considered for calculation purposes. Consequently, the total occupied bandwidth necessary for this particular N-MCS system is 12 kHz. This in turn requires that the fee be calculated based upon the use of 12 1-kHz bandwidth units as applicable for N-MCS operation below 1 GHz. The corresponding fee calculation is as follows:

\[
12(\$0.001 \times 202,799) = 2,433.59, \text{ which is rounded up to an annual fee of } \$2,434.
\]