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Client Procedures Circular

Licensing Procedure for Broadband Public Safety Communications Operating in the Frequency Band 4940-4990 MHz

Preface

Client Procedures Circulars describe the various procedures or processes to be followed by the public when dealing with Industry Canada. The information contained in these circulars is subject to change without notice. It is therefore suggested that interested persons consult the nearest district office of Industry Canada for additional details. While every reasonable effort has been made to ensure accuracy, no warranty is expressed or implied. As well, these circulars have no status in law.

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All Spectrum Management and Telecommunications publications are available on the following website <http://ic.gc.ca/spectrum>.

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1. Principle

The Minister of Industry, through the *Department of Industry Act*, the *Radiocommunication Act* and the *Radiocommunication Regulations*, with due regard to the objectives of the *Telecommunications Act*, is responsible for spectrum management in Canada. As such, the Minister is responsible for developing national policies and goals for the effective use and management of the radio frequency spectrum.

2. Mandate

Under section 5(1)(a)(i.1) of the *Radiocommunication Act*, the Minister of Industry may issue spectrum licences in respect of the utilization of specified radio frequencies within a defined geographic area. The Minister may fix the terms and conditions of any such licence, including terms and conditions as to the services that may be provided by the holder thereof. In accordance with section 19 of the *Department of Industry Act*, the Minister may fix fees in respect of the rights and privileges provided by a spectrum licence.

3. Background

Over the past few years, Industry Canada has worked with the public safety community to facilitate the improvement of critical communication infrastructure, and to implement open standards and improved access to spectrum resources in new bands.

Public safety agencies have indicated to the Department that use of the band 4940-4990 MHz is critical to support advanced broadband technologies that enable high-speed wireless transfers of large data files, images and video, as well as to provide intranet access at specified locations.

In July 2004, the Department added a primary mobile allocation for the band 4940-4990 MHz and designated it for fixed and mobile use in support of public safety activities. In July 2005, the Department released a public consultation on the use of this band through *Canada Gazette* Notice DGTP-005-05. This consultation sought comments on proposed policy, technical and licensing considerations to accommodate public safety agencies' early implementation of critical broadband systems in the band 4940-4990 MHz.

Subsequently, in June 2006, *Canada Gazette* Notice DGTP-005-06, *Spectrum Utilization Policy, Technical and Licensing Requirements for Broadband Public Safety in the Band 4940-4990 MHz* (SP 4940 MHz) announced the release of this band to exclusively accommodate public safety use for the preservation of life and the protection of property.

4. Policy

Industry Canada stands committed to preserving the highest level of safety and security for Canadians, and to working with the public safety community to increase the effectiveness of its critical communications systems. The Department is also committed to improving mutual aid and border security. Accordingly, Canada has harmonized spectrum use and radio equipment standards with the

United States, where feasible, to facilitate interoperable networks and services with public safety agencies.

5. Procedure

5.1 Fixed and Mobile Use

The band 4940-4990 MHz is allocated for both fixed and mobile services in support of public safety for the preservation of life and protection of property. The primary designated use of this band is broadband mobile services for public safety and fixed systems that directly support these broadband mobile systems.

Public safety agencies may, on a case-by-case basis, be licensed to deploy fixed point-to-point systems in this band that do not operate as part of a broadband mobile public safety service. These systems will be licensed on a secondary basis at the discretion of the spectrum management district director of the local Industry Canada office. Aeronautical mobile applications are also not normally permitted, except on a case-by-case basis.

5.2 System Technology

Licensees are to coordinate operations with other licensees in order to minimize and resolve potential interference issues. To facilitate the sharing of frequency band 4940-4990 MHz among licensees, the Department is encouraging the use of “smart” technologies. These technologies use frequency hopping (also known as spread spectrum) and dynamic frequency selection to minimize interference among various users of the same radio frequency spectrum and, as such, facilitate coordination among these licensees.

5.3 Channelling Plan

The channelling plan consists of ten 1 MHz channels and eight 5 MHz channels as indicated in the table below.

Channel Designation	Lower Frequency (MHz)	Upper Frequency (MHz)	Bandwidth (MHz)
A	4940	4941	1
B	4941	4942	1
C	4942	4943	1
D	4943	4944	1
E	4944	4945	1
F	4945	4950	5
G	4950	4955	5
H	4955	4960	5
I	4960	4965	5
J	4965	4970	5
K	4970	4975	5

Channel Designation	Lower Frequency (MHz)	Upper Frequency (MHz)	Bandwidth (MHz)
L	4975	4980	5
M	4980	4985	5
N	4985	4986	1
O	4986	4987	1
P	4987	4988	1
Q	4988	4989	1
R	4989	4990	1

All channels are available on a shared basis and will not be assigned for the exclusive use of any licensee. No frequency sub-allocation plan will be adopted. Channels may be aggregated or partitioned for higher capacity or higher bandwidth applications to allow maximum flexibility and implementation of future broadband technologies.

For further information pertaining to the channel plan, refer to *Spectrum Utilization Policy, Technical and Licensing Requirements for Broadband Public Safety in the Band 4940-4990 MHz* (SP 4940 MHz).

5.4 Incumbents

Since the release of SP 3-30 GHz in October 2004, all incumbents have retuned and cleared the band 4940-4990 MHz to allow for public safety assignments, with the exception of the radio astronomy service.

Canada currently has two radio astronomy observatories, one in Penticton, British Columbia, and the other in Algonquin, Ontario. As noted in the *Canadian Table of Frequency Allocations 9 kHz to 275 GHz* (2005 Edition), the radio astronomy service is allocated in the band 4950-4990 MHz on a co-primary basis, and is protected under international footnote 5.149¹ from harmful interference.

6. Licensing Considerations and Application Procedures

6.1 Eligibility

The Minister of Industry has determined that the public interest will be best served by giving public safety agencies preference to use the 4940-4990 MHz frequency band for their radio systems. This is in keeping with the Department's principle of providing priority access to radio spectrum to safety services. However, it is also recognized that other government agencies may be involved in activities related to the preservation of life and the protection of property, and therefore may have a need for similar radiocommunication systems. Consequently, to ensure that all such agencies have an opportunity to access the band 4940-4990 MHz, the Minister has adopted the following licensing hierarchy:

- Category 1 - police, fire and emergency medical services;

¹ In making assignments to stations of other services to which the band 4940-4990 MHz are allocated, administrations are urged to take all practicable steps to protect the radio astronomy service from harmful interference.

- Category 2 - forestry, public works, public transit, dangerous chemical clean-up, customs and other agencies contributing to public safety; and
- Category 3 - other government agencies and selected supervisory personnel of certain non-government agencies (i.e. hydro and gas utilities).

Access to the band 4940-4990 MHz by Category 2 and 3 applicants will be reviewed by Industry Canada. Access may be granted where licensing of Category 2 or 3 applicants does not hinder development and use of systems dedicated to higher priority Categories.

Public safety agencies are encouraged to establish partnerships with other agencies for sharing networks so as to increase efficiencies and facilitate interoperability. Where one network serves more than one public safety agency, the spectrum licence will be issued to the entity(ies) operating the network.

It is also recognized that public safety agencies may determine that non-public safety entities are better able to provide the advanced radiocommunication services envisaged for this band. As such, non-public safety entities may apply for a spectrum licence in the band 4940-4990 MHz to provide services exclusively to public safety agencies. These applicants must clearly demonstrate which public safety agencies will be served by their radiocommunication systems. The same hierarchy as noted above will apply.

Eligibility criteria to hold spectrum licences are outlined in the *Radiocommunication Regulations*. For entities that will be operating as radiocommunication carriers, further information regarding ownership and control requirements is provided in Client Procedures Circular, *Canadian Ownership and Control* (CPC-2-0-15), as amended from time to time.

6.2 Licensing Issues

Licence applications can be submitted to any Industry Canada spectrum management office.² The Department also encourages applicants to consult with the local spectrum management office prior to the submission of an application to ensure that frequency bands being requested are appropriate to meet their needs.

6.2.1 Spectrum Licensing

The band 4940-4990 MHz is allocated for both fixed and mobile broadband systems on a co-primary basis. Eligible applicants will be issued spectrum licences on a first-come, first-served basis for the full 50 MHz covering their respective area of jurisdiction. Individual site licences will not be required; however, for coordination and interference analysis purposes, licensees may be required to provide technical information regarding their radiocommunication system. Details regarding the process and format required for the submission of this information are outlined in Client Procedures Circular *Licensing Procedure for Spectrum Licences for Terrestrial Services* (CPC-2-1-23).

² A list of Industry Canada spectrum management offices is provided in Radiocommunication Circular 66. (RIC-66), available at the following departmental website: <http://ic.gc.ca/epic/site/smt-gst.nsf/en/sf01742e.html>

Licensees that operate within the same or overlapping geographical service area are required to coordinate among themselves for the use of this band.

6.2.2 Licensing of Fixed Stations on a Secondary Basis³

Fixed systems not operating as part of a broadband mobile public safety service in the frequency band 4940-4990 MHz may be licensed for other public safety communication systems, on a secondary basis and at the discretion of the spectrum management district director. This will allow sufficient flexibility to support a variety of public safety applications. These systems will be licensed on a site-by-site basis, using procedures outlined in Radio Standards Procedure 113, *Application Procedures for Planned Radio Stations above 960 MHz in the Fixed Service* (RSP-113)⁴.

6.2.3 Licence Term

The term for spectrum licences will be 10 years from the original date of issue. These licences will expire on March 31 following the tenth anniversary of licence issuance.

6.2.4 Licence Fees

Fees for these spectrum licences are outlined in *Canada Gazette* Notice DGRB-003-08, *Fees for Spectrum in the Radio Frequency Band 4940-4990 MHz for Broadband Public Safety Communications*.

7. Conditions of Licence

The following conditions apply to spectrum licences for broadband public safety services in the frequency band 4940-4990 MHz.

7.1 Laws, Regulations and Other Obligations

The licensee is subject to, and must comply with, the *Radiocommunication Act*, the *Radiocommunication Regulations*, the International Telecommunication Union (ITU) *Radio Regulations* and the Canadian *Table of Frequency Allocations* pertaining to its licensed radio frequency bands. The licence is issued on condition that the certifications made in the application materials are all true and complete in every respect.

The Minister continues to have power to amend the terms and conditions of spectrum licences (see section 5(1)(b) of the *Radiocommunication Act*). Such powers would be exercised on an exceptional basis and only after full consultation. Section 40 of the *Radiocommunication Regulations* continues to apply.

³ Definition provided in the *Canadian Table of Frequency Allocations*, available at the following website: http://ic.gc.ca/epic/site/smt-gst.nsf/en/h_sf01678e.html

⁴ Related radio station licence fees are charged in accordance with the *Radiocommunication Regulations*.

7.2 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, *Radiocommunication and Broadcasting Antenna Systems* (CPC-2-0-03), as amended from time to time. Licensees must ensure that they meet all land-use consultation requirements specified in CPC-2-0-03.

7.3 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).⁵ Although the responsibility for developing Safety Code 6 rests with Health Canada, Industry Canada has adopted this guideline for the purpose of protecting the general public.

It is the responsibility of the licensee to ensure that all related radiocommunication installations comply with Safety Code 6 at all times, including the consideration of combined effects of nearby installations within the local radio environment. Compliance with Safety Code 6 is an ongoing obligation. 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.

7.4 Air Navigation Obstruction Clearance and Marking

In addition to obtaining licence authority from Industry Canada, public safety licensees must also ensure that their applications are reviewed by Transport Canada and NAV CANADA prior to antenna system installation.

Transport Canada will perform an assessment of the proposal with respect to potential hazards to air navigation, and will notify applicants of any painting and/or lighting requirements for the associated antenna system. Applicants should be aware that Transport Canada does not advise Industry Canada of marking requirements for proposed antenna structures.

NAV CANADA will also comment on whether the proposed antenna system has an impact on the provision of its national air navigation system, facilities and other services located off-airport.

As required, licence applicants must:

- submit an Aeronautical Obstruction Clearance form (#26-0427) to Transport Canada;
- submit a Land-use Proposal Submission form to NAV CANADA;
- install and maintain associated antenna systems in a manner that is not a hazard to aeronautical safety; and
- retain all related correspondence.

⁵ A copy of Safety Code 6 is available at the following Health Canada website: http://hc-sc.gc.ca/ewh-semt/pubs/radiation/99ehd-dhm237/index_e.html.

Aeronautical Obstruction Clearance forms are available from any Transport Canada Aviation Group Office. Both the Aeronautical Obstruction Clearance form and a list of Transport Canada Aviation Group regional offices are available on Transport Canada's website.

Land-use Proposal Submission forms are available from NAV CANADA, and completed forms are to be sent to the appropriate NAV CANADA General Manager Airport Operations (GMAO) office, East or West.

7.5 Radio Astronomy

Licensees must ensure that harmful interference is not caused to Canadian radio astronomy observatories, and that this protection is continued should new radio astronomy operational requirements arise in the future.

7.6 Payment of Licence Fees

Licence renewal fees are due on or before March 31 for the upcoming fiscal year, commencing April 1 annually.

8. Technical Considerations

8.1 Spectrum Utilization and Equipment Requirements

The following section specifies the technical requirements for the authorization of public safety systems operating in the band 4940-4990 MHz.

The transmitting power of stations operating in the band 4940-4990 MHz must not exceed the maximum limits specified in the tables below. However, all systems should be limited to the power necessary to provide adequate coverage.

Limits for Operation of High-power Devices

Channel Bandwidth (MHz)	High-power Peak Transmitter Power (dBm)
1	20
5	27
10	30
15	31.8
20	33

Devices may use other bandwidths; however, high-power devices are limited to a peak power spectral density of 21 dBm per 1 MHz. If a directional gain greater than 9 dBi is used, both the peak transmit power and peak power spectral density should be reduced by the equivalent amount.

For high-power fixed point-to-point and point-to-multipoint operation, a directional gain of up to 26 dBi may be used; however, if it exceeds 26 dBi, both the peak transmit power and peak spectral density should be reduced by the equivalent amount.

Limits for Operation of Low-power Devices

Channel Bandwidth (MHz)	Low-power Peak Transmitter Power (dBm)
1	7
5	14
10	17
15	18.8
20	20

Devices may use other bandwidths; however, low-power devices are limited to a peak power spectral density of 8 dBm per 1 MHz. If a directional gain greater than 9 dBi is used, both the peak transmit power and peak power spectral density should be reduced by the equivalent amount.

All radio equipment must be certified by Industry Canada. Radio Standard Specification, *Broadband Public Safety Equipment Operating in the Band 4940-4990 GHz* (RSS-111), specifies the details regarding certification of radio equipment used in this band for public safety operations.

For further information, refer to SP 4940 - *Spectrum Utilization Policy, Technical and Licensing Requirements for Broadband Public Safety in the Band 4940-4990 MHz*.

8.2 Radio Interoperability

At this time, Industry Canada is not establishing a dedicated channel for radio interoperability nor recommending a specific common/open standard. However, radio interoperability is considered an essential feature for public safety applications and the Department may establish radio interoperability guidelines based on the results of the consultation process initiated by *Canada Gazette* Notice No. SMSE-005-06, *Consultation Paper on Public Safety Radio Interoperability Guidelines*.

The Department requires licensees to implement systems which are interoperable with all public safety entities so that they can function effectively when an emergency arises. As a result, applicants may be required to submit to the local Industry Canada spectrum management district director, a radio interoperability plan which includes agencies operating within their jurisdictional area, as well as those in overlapping or adjacent jurisdictional areas. Final determinations as to required licensing conditions pertaining to interoperability will be made by the district director.

8.3 System Coexistence Guidelines and Domestic Coordination

All licensees operating in the band 4940-4990 MHz shall cooperate in the selection and use of channels in order to reduce interference and make effective use of the spectrum. Licensees who experience or cause interference (even though the technical specifications of both SP 4940 MHz and RSS-111 are met) are expected to cooperate and jointly resolve issues to ensure equitable access to the spectrum by all operators.

All data and calculations used during coordination shall be retained by the licensees and be made available to Industry Canada upon request.

When conflicts between licensees cannot be resolved, the Department should be advised. Following consultations with the affected parties, the Department will determine the necessary course of action. This may include the imposition of restrictions such as specifying reduced transmitter power, antenna heights, area or hours of operation for the stations involved.

To facilitate domestic coordination, licensees are to contact their nearest local Industry Canada spectrum management office to obtain necessary contact information for other public safety service licensees operating locally in the band 4940-4990 MHz. In future, licensees will be able to directly access and utilize an appropriate departmental information database, designed for this purpose.

8.4 International Coordination

All licensees must comply with the requirements of cross-border frequency sharing and coordination arrangements established between Canada and the United States, as amended from time to time. Although frequency assignments are not normally subject to site-specific licensing, licensees must be prepared to provide technical data for any given site to Industry Canada, if requested. Submission of this data would be required for reasons such as the resolution of coordination conflicts, as well as possible interference issues.

9. Related Documents

Spectrum Utilization Policy, *Technical and Licensing Requirements for Broadband Public Safety in the Band 4940-4990 MHz* (SP 4940 MHz)

Client Procedures Circular, *Radiocommunication and Broadcasting Antenna Systems* (CPC-2-0-03)

Client Procedures Circular, *Canadian Ownership and Control* (CPC-2-0-15)

Radio Standards Specification, *Broadband Public Safety Equipment Operating in the Band 4940-4990 MHz* (RSS-111)

Client Procedures Circular, *Guidelines for the Submission of Applications* (CPC-2-0-01)

Client Procedures Circular, *Licensing Procedure for Spectrum Licences for Terrestrial Services* (CPC-2-1-23)

Canadian Table of Frequency Allocations 9 kHz to 275 GHz (2005 Edition)

Radio Standards Procedure, *Application Procedures for Planned Radio Stations Above 960 MHz in the Fixed Service* (RSP-113)

Limits of Human Exposure to Radiofrequency Electromagnetic Fields in the Frequency Range from 3 kHz to 300 GHz (Safety Code 6)

Notice No. SMSE-005-06, Consultation *Paper on Public Safety Radio Interoperability Guidelines*.

Radiocommunication Information Circular, *Addresses and Telephone Numbers of Regional and District Offices* (RIC-66)