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Spectrum Management

Radio Systems Policy

# **Radio Systems Policy for Radio Paging with Special Reference to the 900 MHz Band**

**Canada**

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Spectrum Management

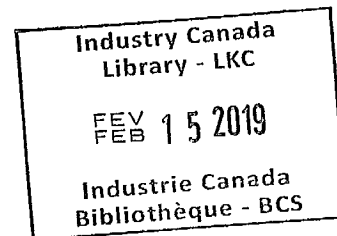
Radio Systems Policy

# **Radio Systems Policy for Radio Paging with Special Reference to the 900 MHz Band**

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## 1. Intent

This document contains an overall radio systems policy for radio paging with special reference to the band 929-932 MHz. In large part, this document specifies policy approaches which have traditionally been taken with respect to public and private radio paging operations in the past. The technical considerations for the licensing of radio paging systems in the band, 929-932 MHz may be found in the companion document SRSP 504.

## 2. Background

In July, 1986, following a period of public consultation, the Department issued a Gazette Notice announcing the release of a paper entitled *Spectrum Utilization Policy for the Fixed, Mobile, Radiolocation and Amateur Services in the Band 890-960 MHz-SP 300.89*. This paper designated the band 929-932 MHz for use by radio paging operations. This decision was, in part, based on interest that had been shown in Canada for more local, regional and nationwide paging services, and the potential for the development of a compatible Canada/U.S. paging service. Following this, in April, 1987, the Department released a proposed version of this Policy for Radio Paging (RP-011) along with the companion technical guidelines (TRC-73) for public comment.

## 3. General Radio-paging Policy

### 3.1 Definitions

In this context, **radio paging** is usually understood to be a one-way alerting signal to individuals or groups of individuals by means of tone only, tone plus alphanumeric readout or tone plus a brief voice message from one or more of a set of fixed locations. This definition differs from the more restrictive one adopted by the CCIR<sup>1</sup> for radio paging which defines radio-paging as a non-speech, one-way, personal selective calling system with alert, without message or with defined message such as numeric or alphanumeric. Although it is the intent of the Department to continue to allow tone and voice signalling to be included within the definition of radio paging, non-voice paging will be offered frequency assignment priority in licensing over tone plus voice in heavily congested areas due to its better spectrum efficiency.

A **nationwide paging service** is made up of a compatible set of regional or local paging systems with suitable system interconnection such that any paging receiver in this service can be paged anywhere in Canada where the service is offered, without the need for adjustments to the receiver, when moving from one paging coverage area to another. Currently, this requires a common address system, modulation scheme and coding standard and for single channel paging systems, a common channel assignment. These specifications may be developed by one operator or by a consortium of operators and proposed to the Department for approval.

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1 CCIR Rec. 584-1, "Standard Codes and Formats for International Radio Paging"

It should be noted that this definition does not require that all pages be transmitted in all areas. For the majority of pages, it should be possible to encourage limiting the paging transmission to a number of local service areas by means of variable tariffs and other operational mechanisms.

While roaming (i.e. service to subscribers who roam on a regular basis from their "home" area) must be given priority by service operators on channels designated for nationwide paging, it is acknowledged that the paging requirements of roaming users will likely never fully utilize the capacity of any nationwide channel. Therefore, operators are permitted to offer in addition, local and regional paging service on designated nationwide channels as long as capacity always remains available for the primary purpose, nationwide paging service.

**A regional paging service** is one which provides subscribers with continuity of paging service on a common frequency normally in two or more adjacent communities or within a number of discrete communities in a defined regional area. Contiguous service between these discrete communities would not be necessary in the latter case.

**A local paging service** is primarily for paging subscribers in a given community. It should be noted that, if an operator of a local paging system eventually intends that his operation develop into a part of a regional or nationwide service, generally the considerations given above for such services would apply.

An **In-Building/In-Plant** paging service is one whose service area is limited to the contiguous facilities and/or property of a company, institution or other organization.

**A private paging system** is one operated to provide paging services to a specific clientele, such as employees of a company or other organization. It could also include a system established co-operatively by a consortium or co-operative for serving the staff of its members. The costs for system operation and maintenance are generally borne by the licensee and there are no per unit monthly usage or subscriber charges. In some cases, private paging services are offered on a time shared basis on frequencies assigned to satisfy the same licensees' mobile radio needs.

**A public paging system** is one operated to provide paging services to any member of the public who may subscribe under terms, conditions and tariffs set by the operator.

**These paging system definitions** can be categorized as shown in Table A.

Institutional Characteristics	Geographical Characteristics			
	Nationwide	Regional	Local	In-Building/In-Plant
Public	*	*	*	*
Private	-	-	*	*

**Table A**  
**Paging System Cateogrization**

Legend: \* permitted  
- not permitted

### 3.2 Spectrum Efficiency/Modes of Paging

There are, at the present time, four modes of paging currently in use. In ascending order of on-air time usage and descending order of spectrum efficiency, they are:

- a) paging-tone only;
- b) paging-tone plus a short numeric readout (e.g. telephone number, clients code etc.);
- c) paging-tone plus a short alphanumeric readout message;
- d) paging-tone plus a short audio message.

In all of the above modes, the "tone" may be either aural, visual, tactile, or combinations thereof at the discretion of the system operator.

In areas and in frequency bands of intensive spectrum use, when the licensing of one paging applicant may result in the denial of licensing of others, preference will be given to more spectrally efficient systems whose operation will provide the greatest public good.

Generally, private paging systems are less able than public paging systems to fully load a paging channel. On the other hand, private paging services using lower powers, often provide coverage on a very localized basis (i.e. in-building/in-plant paging services) and for this reason, with geographic frequency reuse, are quite efficient. In order of efficiency and of maximizing the public good, local (i.e. city-wide) private paging systems may rank below those of public paging systems and in areas of heavy spectrum usage may be denied spectrum. The Department will not, as matter of policy, license private systems that are regional or nationwide in nature. It will however license private in-building/in-plant systems and private local systems to the extent possible.

### **3.3 Coverage Area Considerations**

It should be noted that the Department does not envisage the establishment of a separate linking infrastructure to support the operation of a nation-wide or inter-provincial paging system as described in Section 4, below. Nation-wide paging licensees will accordingly be directed to existing facilities designed to provide this service.

Simulcasting will normally be permitted only in contiguous service areas. This restriction on simulcasting will be waived if the operator can demonstrate some practical method to moderate its impact on spectrum loading beyond the customary coverage area as determined by normal technical station parameters.

### **3.4 Enhanced Services**

Notwithstanding the definition of radio paging provided in Section 3.1, radio paging licensees may wish, as well, to offer certain enhanced services which might, for example, include: stock market quotations, airline arrival and departure information, sports scores, race results, etc. Such enhanced services can be provided without further authorization on the condition that they are provided in a manner which does not hamper the primary radio paging service of one-way alerting and that no change in technical operating characteristics results.

## **4. Policy Specifically Related to the 900 MHz Paging Band**

### **4.1 Nationwide Paging Services**

Generally, paging systems in frequency bands other than 900 MHz share spectrum with non-paging uses, and serve mainly local area paging needs using different channels in different areas and various signalling and control protocols. By contrast, the use of the band 929-932 MHz for radio paging services is common across Canada and the USA. Therefore, the potential for nationwide and compatible Canada/U.S. operations exists in this band. The channels used for nationwide paging in the USA in the band 931-932 MHz are also designated for nationwide paging in Canada. In addition, channels will be made available from the band 931-932 MHz for exclusive Canadian nationwide service.

In order to allow for the development of Canada/U.S. paging, assignment in Canada of the Canada/U.S. common nationwide channels is subject to the following conditions:

- (1) The Canadian applicant must propose a method to handle United States roamers on a reciprocal basis using a compatible signalling and modulation scheme; and
- (2) The Canadian applicant must propose a method of sharing of the nationwide channels allocations for areas near the Canada/U.S. border in accordance with the interim Canada/U.S. sharing arrangement (refer to SRSP 504); and
- (3) Transborder paging operations are subject to the current informal transborder paging arrangement between the FCC and Communications Canada.

## 4.2 Regional, Local and In-Building/In-Plant Paging

Regional, local and in-building/in-plant paging will be accommodated in the bands 929-930 MHz and 931-932 MHz. The implementation of paging systems in these bands is subject to the conditions prescribed in Section 6.

## 4.3 Reserve Spectrum

The band 930-931 MHz will be held in reserve for advanced technology experiments, propagation studies and development of innovative paging services which may, for example, require different channel bandwidths and/or different message types. This measure will be subject to review when demand for more frequencies by the conventional paging services outstrips the supply.

## 5. Related Documents

- Spectrum Utilization Policy, SP 300.89, *Spectrum Utilization Policy for the Fixed, Mobile, Radiolocation and Amateur Services in the Band 890-960 MHz*, July 1986.
- Standard Radio System Plan, SRSP 504, *Technical Considerations for the Licensing of Radio Paging Systems in the Band 929-932 MHz*, May 1989.
- Canada Gazette Notice, SMRR-002-89, *Nationwide Paging in the Band 929-932 MHz*, May 5, 1989.
- Radio Systems Policy, RP 004, *Policy for the Licensing of Very Low Capacity Point to Point Links in the Band 30-890 MHz*, October, 1983.
- Spectrum Utilization Policy, SP GEN, *General Information Related to Spectrum Utilization and Radio Systems Policies*, June, 1987.

## 6. 900 MHz Paging Policy Implementation

### 6.1 Fixed Systems Existing on the Effective Date of this Policy

The 1-10 GHz Policy issued in December, 1982 and policy document SP-GEN define frequency diversity. Fixed systems using frequency diversity in the band 890-960 MHz became non-standard on January 1, 1983, as a result of the release of that policy. Such systems were granted a protection period of five years. Since the termination of this period, non-standard frequency diversity systems are not permitted to cause interference to standard systems, which in the band 929-932 MHz, are radio paging systems. Non-standard systems are also required to accept interference from standard systems or make the necessary modifications to avoid interference. However, it should be noted that SP GEN also requires that an advance notification period be given to the licensee of a non-standard system prior to the licensing of standard radio paging system(s) that could affect the operation of the non-standard system.



Other existing fixed systems not meeting the requirements of SP 300.89 (i.e. certain non-diversity systems) became non-standard on the effective date of that policy, July 1986. A protection period of five years until July 1, 1991, will normally apply for such systems. A notification period as described in the previous paragraph will also apply which can be coincident with the protection period.

## **6.2 Alternative Arrangements**

Notwithstanding the above provisions, mutual accommodation between the existing fixed service operator and the prospective radio paging service operator could shorten the transition period and is encouraged. Notification of such agreed accommodation should be furnished to the Department to enable the paging application to be processed so that service may commence ahead of the the dates given in section 6.1 above.

## **6.3 Band Opening**

Applications for regional, local and in-building/in-plant radio paging systems in the 900 MHz band are being accepted at District or Regional Offices of the Department. Generally, assignment for these paging systems will be made in the band 931-932 MHz until demand warrants the use of the band 929-930 MHz. In addition to the normal technical and operational licensing conditions, the licensing of paging systems is also governed by the provisions relating to existing fixed systems as given in paragraph 6.1. A "call for applications" has been made in Gazette Notice SMRR-002-89, dated May 5, 1989, for operation on nationwide and common Canada/U.S. channels.

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