Industry Canada Industrie Canada

CPC-2-1-05
Issue 1
April 2008

Spectrum Management and Telecommunications

Client Procedures Circular

Zone Enhancers

Aussi disponible en français - CPC-2-1-05

Canada

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.

Comments and suggestions may be directed to the following address:

Industry Canada
Radiocommunications and
Broadcasting Regulatory Branch
300 Slater Street
Ottawa, Ontario
K1A 0C8

Attention: DOSP

E-mail: spectrum_pubs@ic.gc.ca

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

Contents

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 spectrum resource use and ensuring effective management of the radio frequency spectrum.

2. Mandate

Section 5 of the *Radiocommunication Act* specifies that the Minister may issue radio licences in respect of radio apparatus. Section 6 of the Act specifies that the Governor in Council may exempt a radio apparatus from the requirement to be licensed.

3. Related Documents

Radio Standards Specification 131 - *Zone Enhancers for the Land Mobile Service* (RSS-131).

Client Procedures Circular 2-1-25 - *Radio Station Licensing Procedure for Radiocommunication Service Providers - System Licensing* (CPC-2-1-25).

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

4. Definitions

“Radiocommunication Service Provider” means a person, including a radiocommunication carrier, who operates radio apparatus used by that person or another person to provide radiocommunication services for compensation;

“Radiocommunication User” means a person who operates radio apparatus for personal or government use or for a business other than the business of a radiocommunication service provider;

“Spectrum Licence” means a licence issued for the utilization of specified radio frequencies within a defined geographic area.

5. General

Zone enhancers (aka “booster amplifiers”) are used to improve the quality of a signal in shadowed locations. They are typically installed at locations where the signal strength of the main station, or the ability of the subscriber/mobile radio to communicate with the main station, is significantly impaired due to topography or building losses. Such locations include valleys, parking garages, larger buildings that have been constructed with materials that tend to inhibit radio frequency penetration, and

communities located near fringe coverage areas. They can be deployed as part of cellular/personal communication service (PCS), paging or other land mobile systems; however, they are not intelligent devices, as they do not perform signal hand-offs.

Zone enhancer radio equipment must be certified for use in Canada in accordance with RSS-131, and is subject to licensing pursuant to subsection 4(1) of the *Radiocommunication Act*.

6. Licensing Policy

6.1 Cellular/PCS Enhancers

Radiocommunication service providers operating cellular/PCS systems may install and operate zone enhancers to improve services in areas of impaired coverage under the authority of their spectrum licence, and without any further authorization requirements from the Department.

Zone enhancers that operate on cellular/PCS frequencies are also available to the public through various outlets. Purchasers of these devices must obtain the consent of the licensed service provider before they can be installed and operated, as these devices have the potential to interfere with the proper operation of the cellular/PCS system, or to cause interference to other users of the radio frequency spectrum, if not installed correctly. Once the consent of the service provider is obtained, the enhancer may be installed and operated under the authority of the service provider's spectrum licence.

6.1.1 Cellular/PCS Mobile Enhancers

Mobile enhancers, also known as in-vehicle cellular amplifiers/repeaters, provide enhanced cellular/PCS signal levels within the confines of a vehicle with no physical connection to the cellular telephone(s) itself. These types of devices utilize two antennas, one external to the vehicle and one internal. The cellular/PCS signal is received by the external antenna, amplified, and then repeated from the internal antenna. Conversely, when the cellular/PCS telephone(s) transmits, the signal is received by the internal antenna, amplified, and then repeated to the cell site via the external antenna.

The licensing policy for cellular/PCS mobile enhancers is identical to the licensing policy for fixed cellular/PCS enhancers (see Section 6.1); purchasers of these devices must obtain the consent of the licensed service provider before they can be installed and operated. As these devices also have the potential to interfere with the proper operation of the cellular/PCS system, or to cause interference to other users of the radio frequency spectrum, they must be installed in accordance with manufacturer's recommendations.

6.2 Non Cellular/PCS Enhancers

Radiocommunication service providers operating systems that provide non cellular/PCS services may also install and operate zone enhancers to improve services in areas of impaired coverage; however, site and frequency-specific radio authorizations are required.

Customers of radiocommunication service providers that choose to obtain a zone enhancer for installation at a specific location to enhance non cellular/PCS service must advise the service provider of

their intent and receive appropriate consent. As a zone enhancer is not considered a subscriber station (see RIC-19), the radio authorization for the device must be held by the service provider.

Site and frequency-specific radio authorizations are also required for radiocommunication users (e.g. police, transit, etc.) who choose to install and operate zone enhancers associated with their systems.

6.3 Technical Requirements

- The zone enhancer's power must respect the following limits:

  - if the zone enhancer utilizes an internal antenna installation (an antenna located within a building), an effective radiated power (e.r.p.) of 30 watts maximum per channel is permitted;

  - if the zone enhancer utilizes an external antenna installation with a maximum height above ground level of 13.5 metres, an e.r.p. of 10 watts maximum per channel is permitted; and

  - antenna heights greater than 13.5 metres, to a maximum of 30 metres above ground level, require e.r.p. reductions in accordance with the following table:

Effective Antenna Height		Maximum e.r.p.	
(metres)	(feet)	(watts)	(dBw)
0-13.5	0-44.3	10	10.0
14	45.9	9.2	9.6
15	49.2	7.9	9
16	52.5	6.8	8.3
17	55.8	6	7.8
18	59.1	5.3	7.2
19	62.3	4.7	6.7
20	65.6	4.2	6.2
21	68.9	3.7	5.7
22	72.2	3.4	5.3
23	75.5	3	4.8
24	78.7	2.8	4.5
25	82	2.5	4
26	85.3	2.3	3.6
27	88.6	2.1	3.2
28	91.9	2	3
29	95.1	1.8	2.6
30	98.4	1.7	2.3

- The coverage area of the zone enhancer must be totally within the coverage area of the main station;

- The zone enhancer must operate on frequencies in use and licensed at the main station.

7. Licensing Procedure

As noted in Section 6.1, a site-specific radio authorization is not required for an enhancer installed to improve cellular/PCS signal levels. Non cellular/PCS enhancers, however, require the submission of a radio licence application and the issuance of a radio authorization. All zone enhancer authorizations will contain the following condition:

> *Authority is granted on a no-interference, no-protection basis and is subject to departmental review and/or withdrawal.*

(For Industry Canada Use — Channel Capacity: 01, Service Category: FB, Fee Code: E)

8. Extenders

An enhancer placed at the edge of a coverage area may increase (or extend) the coverage area of the main station. These types of installations are permitted for cellular/PCS systems in accordance with the same licensing policies provided for enhancers (see Section 6.1). The use of enhancers as extenders in non cellular/PCS systems is subject to departmental review on a case-by-case basis; site-specific radio licensing applies.