

TECHNICAL ADVISORY

Radio and microwave collector/repeaters on utility poles

This document outlines precautions to ensure personal safety for workers performing work on or near utility poles where Radio and Microwave Frequency Collectors or Repeaters are installed.

Microwave (MW) Radiation refers to electromagnetic fields with frequencies between 300 MHz and 300 GHz; typically produced by microwave ovens, parabolic dish antenna, and radar equipment.

Radio Frequency (RF) refers to electromagnetic fields with frequencies between 300 kHz and 300 MHz; typically produced by radio and TV transmitters, and some industrial equipment. RF/MW energy of sufficient intensity can cause the heating of materials including biological tissue.

Overview

The growth of wireless telecommunications services like the Internet and cell phones is becoming more popular, which has led to increased installation of wireless communications devices or equipment that can create hazardous levels of electromagnetic radiation, especially with the introduction of 5G technology. These devices are becoming more common on poles owned by electric utilities. While installing these equipment on poles reduces the danger to the general public, the RF/MW emissions could pose a hazard to workers who are working on or near the utility poles where the equipment is installed. Workers in different industries like electric utilities, telecommunications, and contractors (e.g., power lines, tree trimming, street lighting) may be required to work on or near utility poles. The intent of this guideline is to help workers reduce the hazards of working near such equipment.

Health Canada publishes a document commonly referred to as “Safety Code 6”. It is titled “Limits of Human Exposure to Radiofrequency Electromagnetic Energy in the Frequency Range from 3 kHz to 300 GHz”. This is one of a series of safety codes that specify the requirements for the safe use of, or exposure to, radiation emitting devices.

Industry Canada sets guidelines to determine the hazard level on a site regardless if there is one or many emitters, and for any shape and size. Industry Canada regulates broadcasting and radio communication installations and apparatus in Canada.

Safety levels for RF/MW energy are established by calculating Specific Absorption Rates (SAR); which is a measure of the rate of energy deposition (the accumulation of materials by a gradual process) per unit mass of body tissue. Through these calculations, hazard levels area around the transmitter(s) is established and a determination is made on how the area is to be treated.

Safety Code 6 makes distinctions for two different environments. One is controlled environments where exposure levels are considered safe for the general public, and the second is uncontrolled environments where access is restricted to persons with specific RF/MW awareness training. Personnel with specific awareness training are able to assess the hazards, determine safe work procedures, and select the appropriate personal protective equipment.

RF/MW industry contractors must submit an attestation for their installations. This attestation incorporates all sources of RF/MW energy at the site, including the energy produced by other installations, such as a competitor's tower. The owner of the site should maintain a copy of the most recent attestation and be able to provide it upon request. When the attestation is not available or is not current, the equipment owner of the latest installation should be contacted and a request made to provide a current attestation.

Equipment/Worker Protection

Before working in close proximity to RF/MW equipment, workers should be aware of equipment and take steps to control or eliminate hazards. Workers should be aware of the minimum safe distance to keep from equipment and, if necessary, contact equipment owner to verify distance for that specific equipment. Workers should keep a minimum distance of 2 metres from equipment and not stand directly in front of them.

Maintaining safe distances may not always be possible with equipment installed on utility poles because a worker may need to work close to them. In this case, the equipment should be turned off. Signs or labels should be provided with contact numbers for the equipment owner so they can temporarily disable the equipment while work is being done on the pole. Power-off switches for equipment should also be clearly identifiable.

Recommended Best Practices

1. Prior to working on utility poles with RF/MW emitting equipment, review Tailboard talks/Job Plans that include how the hazard can be reduced.
2. Ask the owners of the RF/MW equipment to provide the attestation report. This attestation incorporates all sources of RF/MW energy at the site, including energy from other installations, such as a competitor's tower. The owner of the utility pole should maintain a copy of the most recent attestation and be able to provide it upon request.
3. The owner of the utility pole should keep a record of the RF/MW equipment (such as in a GIS) to simplify planning for work on poles with the equipment.

4. The owner of the utility pole should create a process with the owners of the RF/MW equipment for turning off the equipment. The process should include communication and emergency procedures.

5. In cases where the RF/MW equipment cannot be turned off, approved monitoring devices can be used to ensure workers are not exposed to hazardous levels of radiation. Workers must keep the appropriate safe distance from the equipment; otherwise, the equipment should be turned off.

6. Workers not authorized to work on the RF/MW equipment should not access, adjust, relocate, or otherwise tamper with equipment.

Roles & Responsibilities

Employer: It is the employer's responsibility to ensure training, including site-specific orientation, supporting policies, procedures, and adequate supervision are in place.

Supervisor: It is the supervisor's responsibility to identify site-specific health and safety hazards inherent in the work, address worker's health and safety concerns, and ensure workers are following the employer's policies and procedures while complying with the Occupational Health and Safety Act (OHSA) legislation and applicable regulations.

Worker: All workers must follow the rules and regulations, use the equipment, protective devices, and clothing required by their employer. If a worker notices any missing or defective equipment or any protective device(s) that could put themselves or others at risk, or is aware of any violations or potential hazards, they should report it to employer or supervisor.

Summary

When work is being done on a utility pole with RF/MW equipment installed on it, keep a safe distance of at least two metres from the equipment and avoid standing directly in front of it. Ask for the attestation report to verify the RF/MW exposure levels from the equipment. In most cases where a safe working distance from the equipment cannot be maintained, ask for the equipment to be turned off.

Supporting Documentation

Health Canada	<i>Limits of Human Exposure to Radiofrequency Electromagnetic Energy in the Frequency Range from 3 kHz to 300 GHz Safety Code 6</i>
Industry Canada	<i>Spectrum Management and Telecommunications Guideline 01</i> <i>Guidelines for the Measurement of Radio Frequency Fields at Frequencies from 3kHz to 300GHz</i>
Industry Canada	<i>Spectrum Management and Telecommunications Guideline 02</i> <i>Guidelines for the Protection of the General Public in Compliance with Safety Code 6</i>
Industry Canada	<i>Spectrum Management and Telecommunications Guideline 08,</i> <i>Guidelines for the Preparation of Radio Frequency (RF/MW) Exposure Compliance Reports for Radiocommunication and Broadcasting Antenna Systems</i>
Ontario Ministry of Labour	<i>Health & Safety Guideline</i> <i>Radiofrequency and Microwave Radiation in the Workplace</i>

Web links

Health Canada	http://www.hc-sc.gc.ca http://www.hc-sc.gc.ca/ewh-semt/radiation/index-eng.php
Industry Canada	http://www.ic.gc.ca/ http://www.ic.gc.ca/eic/site/smt-gst.nsf/eng/h_sf01841.html
Ontario Ministry of Labour	http://www.labour.gov.on.ca http://www.labour.gov.on.ca/english/hs/pubs/radiation/index.php http://www.labour.gov.on.ca/english/hs/pdf/gl_radio_rad.pdf

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