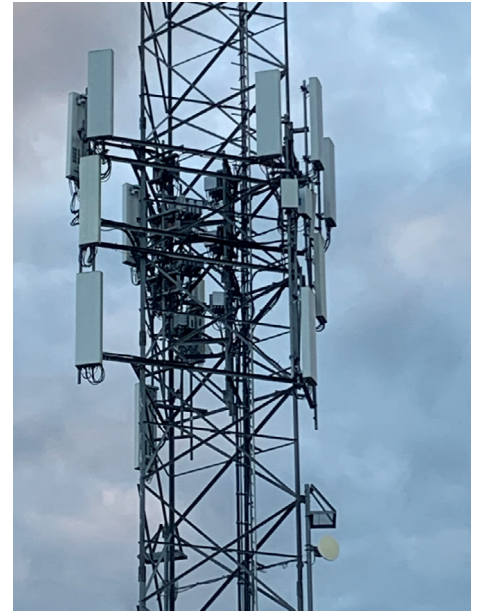


TECHNICAL ADVISORY

Induced voltage while working in proximity to cell towers emitting radio frequencies



These images are just a few samples of what can be found in the field.

This document outlines precautions to ensure personal safety for workers performing while working in proximity to cell towers emitting radio frequencies.

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

In recent years, workers from various industries have reported incidents where electric currents are transmitted to cranes, booms, and other equipment used in close proximity to cell towers that produce radio frequencies (RF).

Cell tower structures that support communications equipment like radio, cellular, and television are becoming more common and will continue increasing in number in the coming years. However, the strong electromagnetic fields produced by these structures can be hazardous as they may cause electric currents to flow through nearby cranes, booms, and hoists or slings being used near an RF tower. These generated currents can be strong enough to cause electrical burns and shocks to workers, potentially resulting in injury or death.

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.

Equipment/Worker Protection

Studies on the reported incidents indicate that factors such as the length and angle of the crane or boom can affect the amount and timing of voltage generated. The length and angle can affect the vibration frequency of the crane line, which then determines the amount of voltage generated. Atmospheric conditions such as dampness or humidity can also affect the amount of voltage generated. It is vital to prioritize worker safety at all times when working in close proximity to RF towers, regardless of boom extension or angle. The following best practices are recommended when working within a kilometre of an RF tower.

The transmitter should be turned off prior to commencing work within 1 kilometre of a freestanding RF tower, because this is the zone where an electrical charge can be triggered in the crane, boom, or other equipment being handled in the area. Even when the power has been turned off, the following procedures should still be followed in the event that the power unexpectedly turns on while work is in progress:

1. Workers should be aware of the proximity of the tower prior to work commencing. Tailboard Talks/Job Plans should include the control or elimination of hazards.
2. Firmly ground cranes and other equipment using ground jumper cables that are securely attached to the equipment.
3. Combustible and flammable materials should be removed from the immediate area prior to work commencing.

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.

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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