RF SAFETY

Agenda

- Summarize ICSC6 RF Safety Program Guidelines for working in RF environment
- How RF Safety Program is implemented to comply with ICSC6 Guidelines
- Potential hazards of RF and how to work safely

Safety Code 6

Health Canada's mandate regarding human exposure to radiofrequency electromagnetic energy from wireless devices is to carry out research into possible health effects, monitor the scientific literature related to such effects, and develop exposure guidelines.

Health Canada reminds all Canadians that their health is protected from radiofrequency fields by the human exposure limits recommended in Safety Code 6. Health Canada has established and maintains a general public exposure limit that incorporates a wide safety margin and is therefore far below the threshold for potentially adverse health effects.

Purpose of RF Safety Program

- Establish a controlled (occupational) RF work environment that complies with Industry Canada Safety Code 6 (2009) Radio Frequency Exposure Guidelines
- Provide direction to safely work in areas where Radio Frequency (RF) emitting equipment is present

Occupational / Controlled Exposure Limits

- Exposure is work-related
- Users are fully aware of their potential for exposure
- Users have knowledge to (& can) control their exposure
- Awareness and training - safety program & warnings

Uncontrolled / General Population Exposure limits

- Can be applied for all exposure situations
- Occupational use when no training or knowledge of exposure
- Users may satisfy occupational use requirements but bystanders must satisfy general population requirements
- Maximum Permissible Exposure (MPE) limits for uncontrolled RF environment are set at 1/5 (20%) of the MPE limits for a controlled RF environment.

ICSC6 Guidelines for controlled environment

- Documented RF Safety Program
  - A safety program does not exist unless it is documented
- Management Support
  - A safety program must have the full backing of management if it is going to work
- Education and Communication
  - The safety program must be communicated to employees and they must understand the work rules, procedures, and policies that they are expected to follow
- Safety Program Enforcement
  - Rules, procedures and way of working defined in the RF Safety Program must be used and enforced
- Identification of Hazard Areas
  - An RF Field Survey is required to identify areas where MPE (Maximum Permissible Exposure) levels exceed Occupational /controlled environment as well as General Public/ uncontrolled environment limits.

ICSC6 Guidelines for controlled environment

- Marking and Control of Hazard Areas
  - Potential hazard areas have to be clearly marked with signs and physical barriers, as required. Engineering and Administrative controls if and where required, must be documented.
- Controls and/or Work Practices
  - Must have established work practices and controls for both visitors and employees so they understand what to expect, how to react and respond to alarm conditions when working in areas where RF levels are approaching or exceeding ICSC6 limits.
- Health & Safety Program
  - H&S Team should be able to screen out employees with electronic medical implants so they are made aware they may face additional risks in RF field levels above those permissible for General Public. Also, the H&S Team must have provisions to handle overexposure incidents, whether real, or ultimately found to be unsubstantiated.
- Scheduled Safety Program Reviews
  - The safety program should be reviewed on a regular basis to identify and resolve deficiencies.
- Assignment of Responsibility
  - There must be a clearly identified RF Safety person (an RF Safety Officer, RFSO). This individual will have the necessary authority and resources to implement and enforce all aspects of the RF Safety Program.

Canada Safety Code 6 (2009)

- Limits defined for Controlled and Uncontrolled environments
- Variable time averaging
- Survey intervals recommended
- Three different signs - Notice, Warning and Danger - depends on levels

RF safety Signs

ICSC6

Notice sign is used to distinguish the boundary between the General Population / Uncontrolled and the Occupational / Controlled areas.

Site Specific

Limits associated with this notification must be less than Occupational / Controlled MPE

Minor injury possible from misuse

Visitors must be escorted.

RF Safety signs

- The Warning sign denotes the boundary of areas with possible RF levels greater than the guidelines for Occupational / Controlled MPE.
- Serious injury possible from misuse
- Applies to Rooftops with OTA (live air) systems.
- All access doors to roof are locked.
- Access requires lock-out / tag-out procedure for transmitters.
- Personnel must carry personal RF safety monitors while on the roof.

RF safety signs

- The Danger sign denotes the boundary of areas with possible RF levels substantially (1000 x) greater than the guidelines for Occupational (Controlled) MPE.
- Area of Denied Occupancy
- Critical Injury or Death Possible

Potential RF Exposure Risks and Controls

- General: risk of RF shocks, burns, injury from muscle reflex, due to bare skin touching open RF connections.
- Controls:
  - Post “NOTICE” signs at all entrances
  - Post RF Safety rules and ways of working rules
  - Mandatory RF safety training before allowing employees to work with RF
  - General Public (visitors) not allowed access unless escorted by a competent person

Potential RF Exposure Risks and Controls

- Rooftop Antennas
  - Controls:
    - Roof entrances must be locked with RF “WARNING” signs posted.
    - Transmitters must be powered off with lockout/tag-out procedure before accessing roof.
    - Wear personal RF Safety Detectors with exposure level logging capability when accessing OTA roof sites.
    - All antenna installations are to be documented with location maps, physical installation drawings, RF field density survey results and safe distance calculations.

RF Exposure Incident Handling

- All RF exposure incidents, have to be reported to Health and Safety and to the RFSO immediately.
- H&S team will take any required medical responses depending on the nature of the injury.
- The RFSO will investigate the underlying conditions
  - make RF field density measurements and calculations to determine exposure levels and take appropriate corrective measures.
- Incident and conditions have to be documented by the RFSO.
  - records must be kept indefinitely.

Symptoms of RF Exposure

- Personnel should be instructed to inform the RFSO of potential over-exposure. Symptoms may be:
  - Skin erythema or burns
  - Perception of body heating or aural effects
  - Shocks or other physical injuries
  - Suspected interference with implanted medical devices

Questions?