Radio Frequency Radiation Hazards

You cannot see it, you cannot hear it, you cannot smell it – but exposure to radio frequency (RF) hazards can be harmful to humans. New cellular antennas and other RF emitting devices are being installed as quickly as possible. There are currently over 500,000 operating devices in the United States alone. That number is expected to double in the very near future as the demand intensifies for more powerful wireless devices.

Most telecommunications and third party workers are not trained in the proper procedures for working in the vicinity of RF emitting devices. With "stealth sites" becoming something of the norm, most workers do not even know the devices are present in their work area, because the devices are hidden from the public. Will this be the next occupational disaster similar to asbestos exposure?

RF Radiation Defined

Radio waves and microwaves are forms of electromagnetic energy that are collectively described by the term "radiofrequency," or "RF." RF emissions and associated phenomena can be discussed in terms of "energy," "radiation" or "fields." Radiation is defined as the propagation of energy through space in the form of waves or particles. Electromagnetic radiation can best be described as waves of electric and magnetic energy moving together (i.e., radiating) through space. These waves are generated by the movement of electrical charges through a substance such as a conductive metal object or antenna. For example, the alternating movement of charge (i.e., the "current") in an antenna used in a cellular base station antenna generates electromagnetic waves that radiate away from the "transmit" antenna and are then intercepted by a "receive" antenna integrated into a hand-held device such as a cellular telephone. The term "electromagnetic field" is used to indicate the presence of electromagnetic energy at a given location. The RF field can be described in terms of the electric and/or magnetic field strength at that location.

Biological Effects of RF Radiation

There are many published reports in the scientific literature concerning possible biological effects resulting from animal or human exposure to RF energy. Biological effects that result from heating of tissue by RF energy are often referred to as "thermal" effects. It has been known for many years that exposure to high levels of RF radiation can be harmful due to the ability of RF energy to heat biological tissue rapidly. This is the principle by which microwave ovens cook food, and exposure to very high RF power densities can clearly result in heating of biological tissue and an increase in body temperature. Tissue damage in humans could occur during exposure to high RF levels because of the body’s inability to cope with or dissipate the excessive heat that could be generated. Under certain conditions, exposure to RF energy at power density levels of 1-10 mW/cm² and above can result in measurable heating of biological tissue (but not necessarily tissue damage). The extent of this heating would depend on several factors including: radiation frequency; size, shape, and orientation of the exposed object; duration of exposure; environmental conditions; and efficiency of heat dissipation.

Two areas of the body – the eyes and the testes – are known to be particularly vulnerable to heating by RF energy because of the relative lack of available blood flow to dissipate the excessive heat load (blood circulation is one of the body’s major mechanisms for coping with excessive heat). Laboratory experiments have shown that short-term exposure (e.g., 30 minutes to one hour) to very high levels of RF radiation (100-200 mW/cm²) can cause cataracts in rabbits. Temporary sterility, caused by such effects as changes in sperm count and in sperm motility, is
possible after exposure of the testes to high-level RF radiation (or to other forms of energy that produce comparable increases in temperature).

There are situations, particularly workplace environments near high-powered RF sources, where recommended limits for safe exposure of human beings to RF energy could be exceeded. In such cases, restrictive measures or actions may be necessary to ensure the safe use of RF energy.

The Problem
The proliferation of wireless antennas across the United States has created a human health hazard for third-party workers, including our CWA members. On a daily basis, CWA members work in close proximity to RF radiation transmitting antennas without knowledge or understanding of the health risks. RF emissions can extend from one foot to more than 20 feet from the face of an antenna. There is no "rule-of-thumb" regarding exposure distances; each antenna system is unique. RF radiation is tasteless, odorless and invisible – and in all but a few instances, our membership is not aware of their potential for RF overexposure injuries. Many times, our members do not even know the RF radiation transmitting antenna is present because the installation is “hidden” behind panels or walls, out of public sight.

The Solution
Currently, no comprehensive method of RF radiation safety has been implemented to prevent RF radiation overexposure to CWA represented workers. However, that is all about to change.

The only way to protect third-party workers, including our CWA members and the public, is through the use of a comprehensive RF radiation safety solution that involves all parties that transmit RF, those that host antennas and those that can be affected either physically or financially from RF radiation overexposure. RF CHECK Inc. will implement a National RF Radiation Safety protocol to ensure that our membership has the necessary training, certification and site specific safety information to protect themselves from RF overexposures.

When completed, RF CHECK’s site specific RF safety solution, will allow our CWA members to download the RF Safety Summary Sheet prior to working at the site. The information will be available online or through 24/7 call centers. The RF Safety Summary Sheet is designed to be an integral tool in establishing a National RF Radiation Safety Protocol to ensure that no one is overexposed to RF radiation while working near wireless antennas. The information is updated as changes are made at the site, and annual site audits are performed to ensure the safety procedures are being followed. RF CHECK’s solution is supported by regulatory and legislative leadership, state and local municipalities, professional associations, members of the insurance industry and FCC Licensees’ Health & Safety professionals and national and international labor unions.

The link below will take you to a survey being conducted by RF Check. This survey will provide RF Check and CWA necessary data to help craft continuing initiatives focused on furthering worker safety when exposure to radio frequency radiation is possible.

CLICK HERE TO TAKE THE SURVEY
RF Radiation FAQs For Workers

If your job assignment places you at any type of commercial building or structure, you need to read this.

What is RF radiation? RF is the abbreviation for "radiofrequency." RF radiation consists of waves of electric and magnetic energy moving together (that is, radiating) through space at the speed of light.

How is RF radiation used? Many types of wireless services make use of RF radiation to transmit from wireless antennas to wireless devices. Cellul ar phones, two-way radio services (police, fire, EMS), pagers, television, radio and satellite communications systems all operate using RF radiation.

Are there a lot of wireless antennas? Yes. It is  estimated that there are 500,000 governmental and commercial wireless antennas in the United States today. This number is projected to double within the foreseeable future.

Why are there so many antennas now, and why are there so many more to come? The public’s demand for all things wireless has driven the need for more and more wireless antennas. Everyone now owns one or more wireless devices, and the growing number of applications puts an even further strain on wireless networks.

The demand for additional antennas is also driven by greater efficiency in governmental and business sectors. For instance, in many municipalities, even trash trucks are connected to the Web, and utility companies are now connecting house meters so they may be read wirelessly.

Have there always been a lot of wireless sites? No. Less than 15 years ago, there were only 25,000 antennas, mostly confined to major metropolitan areas and freeway corridors. The antennas at that time were mainly on poles and towers and were only accessible by wireless company employees. These highly (RF) trained industry employees, then as now, are provided the means to protect themselves from the harmful effects of RF radiation. Their wireless companies turn down or shut off the power to the antennas while they perform their work orders.

If wireless workers are provided RF radiation protection, what about the rest of us? Today, a fundamentally flawed system exists to protect all workers from RF radiation overexposure. The RF safety strategies that currently exist were developed in, and for, a bygone era.

Currently, no comprehensive RF radiation safety and health solution is in place. Third-party workers, like yourself, are mostly left unprotected from RF radiation overexposures.

What are my chances of being exposed to RF hazards from a wireless antenna? Unfortunately, your chances are very high if your job assignments require you to perform tasks, on utility poles, on the tops or sides of commercial, federal, state and municipal structures or office buildings, and light standards, just to mention a few areas. In addition to telecommunications workers, commercial trades that commonly come into contact with wireless antennas are electricians, roofers, painters, HVAC employees, sheet metal workers, maintenance workers; construction trades workers, first responders and utility trades employees.

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