# Radiation (Non-Ionizing)




## WHAT’S AT STAKE?

Radiation or Electromagnetic Radiation (EMR), is energy in a wave form. Non-ionizing radiation is very prevalent and comes from both natural and human – made sources. It includes electric and magnetic fields, radio waves, microwaves, infrared, ultraviolet and visible radiation.

The litmus test is how do workers protect themselves or limit their exposure to non – ionizing radiation.

## WHAT’S THE DANGER?

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| **Ultraviolet light** | **• Generated by black light, sunlight** |
| **Visible light** | **• Generated by sunlight, LEDs, light bulbs, lasers** |
| **Infrared light** | **• Generated by sunlight, thermal radiation, incandescent light bulbs, lasers, remote controls** |
| **Microwave radiation** | **• Generated by microwaves, cellphones, and data transmission** |
| **Radio frequency radiation** | **• Generated by AM and FM radio signals, cellphone and data communications, and by radio frequency heaters used to bond vinyls and plastics** |

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| **Extremely low frequency radiation** | **• Generated by transmission lines, old CRT computer monitors** |

**TYPES OF NON – IOZINING RADIATION**

Most people are not aware that they are being exposed to these non – ionizing radiation.

**MORE DANGERS**

Each type of radiation causes different effects on human tissue. The closer workers are to the source of non – ionizing radiation, the more exposure they will experience.

Some jobs expose workers to more non-ionizing radiation than others. Higher exposure work includes:

- Maintenance on radio, cell or TV towers
- Roofing
- Painting
- Building maintenance
- Building inspection
- Window washing
- Welding
- Glassmaking
- Furnaces
- Outdoor workers

## RADIATION HEALTH EFFECTS

Workers will be exposed to radiation dependent on what type of radiation they are exposed to:

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| **Extremely low frequency radiation** | **• Little to no health effects even when working directly at the source of the radiation** |
| **Radio frequency radiation and microwave radiation** | **• Nerve or muscle stimulation<br>• Heat stress as the body warms up, especially in warmer weather<br>• Eye damage (cataracts)<br>• Numbness in the hands** |
| **Ultraviolet radiation** | **• Sunburn<br>• Skin cancer<br>• Welder’s "arc-eye"<br>• Cataracts** |

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| **Infrared radiation** | • **Skin burns**<br>• **Cataracts**<br>• **Retinal burns** |

There is increasing concern around the world that exposure to Very Low Frequency and Extra Low Frequency increases the incidence of a number of cancers. A number of studies have found:

- Increased rates of cancer, in particular leukemia and brain tumors in adults and children living close to power transmission lines.
- Workers in the electricity supply, electronics and communications industries.
- For workers exposed to electronic equipment such as computers and telephone equipment a possible association between the exposure and effects such as miscarriage and various cancers.

There is a great deal of controversy regarding the potential health effects of some types of non-ionizing radiation. There is no doubt that UV radiation causes cancer, but the effects of lower frequency radiation (for example radiation from mobile phones, power lines, electric equipment) are not well known. The truth is that no-one really knows exactly how dangerous some forms of radiation are. There are various reasons for this: the effects may be small and difficult to detect. We are all exposed to various types of radiation in our daily lives, and not enough research has been done.

## HOW TO PROTECT YOURSELF

The best way to reduce the risk of exposure to non-ionizing radiation is to eliminate the source of exposure. If that’s not possible, there are other **RISK CONTROLS** to use which will be identified in your exposure control plan. To protect workers from discreet sources, creating distance between them and the source of the non-iodizing radiation is often effective. As the worker moves away, exposure quickly decreases. If the source is not from a specific location or increasing the distance from the source is not possible, shielding might be appropriate.

## RISK CONTROLS

**Engineering**

Making physical modifications to facilities, equipment, and processes can reduce exposure. Some questions to consider:

- Can guards or barriers be used to restrict access to high exposure areas?
- Can antennas be raised so they are above the working level of the roof?
- Can shields be erected to eliminate nearby workers from exposure?

**Administrative**

Changing work practices and work policies, and using awareness tools, and training, can limit the risk of non-ionizing radiation exposure. Some questions to consider:

- Can the equipment be turned off to do work around it?
- Is access to communication and data transmitting equipment secured or restricted?
- Can warning signs be posted to indicate high radiation areas?
- Can the amount of time workers spend near the antenna be limited?
- Can a notification system be set up to alert contractors when an antenna is present?
- Is a UV protection program in place?

**Personal protective equipment**

This is the least preferred control. It must always be used in addition to at least one other control. Some questions to consider:

- Do workers have the proper eyewear and protective clothing?
- Has personal protective equipment been verified to ensure it is working properly?
- Is sunscreen provided?

## FINAL WORD

Talk to your members of your work group about the hazards of radiation and their control and any effects they may be experiencing on a regular basis.