

Radiation

The necessity of properly signing
hazardous radioactive areas

Field Overview

- Two types of radiation
 - Ionizing - X-rays, gamma rays, and particle bombardment (neutron beam, electron beam, protons, mesons, and others)
 - Nonionizing - Comes in the form of light, radio waves, microwaves and radar
- Nonionizing radiation does not usually cause tissue damage
- Effects of radiation poisoning can be very severe, even fatal
- Radiation poisoning raises risk of getting cancer
- Causes of radiation poisoning could include:
 - An attack on or accident at a nuclear industrial facility
 - Exposure to radiation for excessive medical treatments
- Facilities containing radioactive material are required to warn employees of hazards
 - Emergency procedures, such as decontamination in an emergency shower, should be in place

Ionizing Radiation

OSHA 1910.1096

- Radiation includes
 - X-rays, gamma rays, and particle bombardment (neutron beam, electron beam, protons, mesons, and others)
- Radiation area
 - any area accessible to personnel where radiation exposure levels for 1 hour exceeds 5 millirem
- Employers must maintain exposure records for each employee working in these areas
- Radiation areas must have signs posted reading “Caution Radiation Area”
- Containers holding radioactive material must be labeled “Caution Radioactive Materials”
- All radiation signs must bear the three blade design and have conventional radiation caution colors of magenta on yellow



Symptoms of Radiation Poisoning

- Bleeding from the nose, mouth, gums, and rectum
- Bloody stool
- Bruising
- Dehydration
- Diarrhea
- Fainting
- Fatigue
- Hair loss
- Inflammation of exposed areas (redness, tenderness, swelling, bleeding)
- Mouth ulcers
- Nausea and vomiting
- Open sores on the skin
- Skin burns (redness, blistering)
- Sloughing of skin
- Ulcers in the esophagus, stomach or intestines
- Vomiting blood
- Weakness

Severity of symptoms is dependent on exposure duration and strength

Nonionizing Radiation

OSHA 1910.97

- Electromagnetic Radiation
 - Electrical and magnetic energy moving together through space
 - Includes radio frequencies, microwaves, radars, TV frequencies, *etc.*
- High level exposure (much more than normal microwave ovens)
 - Can result in burns, cataracts, temporary sterility
 - Pacemaker patients should consult with physicians on what to avoid
- Uses of Radio Frequencies or Microwaves include
 - aeronautical radios
 - processing and cooking of foods
 - heat sealers
 - vinyl welders
 - high frequency welders
 - induction heaters
 - flow solder machines
 - communications transmitters
 - radar transmitters
 - ion implant equipment
 - microwave drying equipment
 - glue curing
 - power amplifiers used in EMC and metrology (calibration).
- Custom Radio-Frequency Radiation signs available

Nonionizing Radiation

OSHA 1926.54

- Laser Hazards
 - Class I – Do not emit radiation hazards
 - Class II – Low power visible lasers
 - Class III – Intermediate to moderate power, controls are recommended
 - Class IV – High power laser, hazardous to view and potential fire and skin hazard. Significant controls recommended
- Class II requires Caution Signs
- Class III requires Danger signs



For more information

- [OSHA 1910.1096 – Ionizing Radiation](#)
- [OSHA 1910.97 – Nonionizing Radiation \(Radio Frequency\)](#)
- [OSHA 1926.54 – Nonionizing Radiation \(Lasers\)](#)
- [NMC Datasheets](#)
- Contact National Marker at 800.453.2727